# Division of Behavioral & Cognitive Sciences
# 2006 Committee of Visitors (COV)
# Combined Report

**For the COV Meeting held at the NSF March 23- 24, 2006**

*Includes COV Reports for the Disciplinary Programs of BCS:*

**Archaeology/ Archaeometry**

**Cognitive Neuroscience**

**Cultural Anthropology**

**Developmental & Learning Sciences**

**Geography & Regional Science**

**Linguistics**

**Perception, Action & Cognition**

**Physical Anthropology**

**Social Psychology**

## CORE QUESTIONS and REPORT TEMPLATE

## for
## FY 2006 NSF COMMITTEE OF VISITOR (COV) REVIEWS

**Guidance to NSF Staff:** This document includes the FY 2006 set of Core Questions and the COV Report Template for use by NSF staff when preparing and conducting COVs during FY 2006. Specific guidance for NSF staff describing the COV review process is described in Subchapter 300-Committee of Visitors Reviews (NSF Manual 1, Section VIII) that can be obtained at <www.inside.nsf.gov/od/oia/cov>.

NSF relies on the judgment of external experts to maintain high standards of program management, to provide advice for continuous improvement of NSF performance, and to ensure openness to the research and education community served by the Foundation. Committee of Visitor (COV) reviews provide NSF with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions; and (2) comments on how the results generated by awardees have contributed to the attainment of NSF's mission and strategic outcome goals.

Many of the Core Questions are derived from NSF performance goals and apply to the portfolio of activities represented in the program(s) under review. The program(s) under review may include several subactivities as well as NSF-wide activities. The directorate or division may instruct the COV to provide answers addressing a cluster or group of programs – a portfolio of activities integrated as a whole – or to provide answers specific to the subactivities of the program, with the latter requiring more time but providing more detailed information.

The Division or Directorate may choose to add questions relevant to the activities under review. NSF staff should work with the COV members in advance of the meeting to provide them with the report template, organized background materials, and to identify questions/goals that apply to the program(s) under review.

**Guidance to the COV:** The COV report should provide a balanced assessment of NSF's performance in two primary areas: (A) the integrity and efficiency of the ***processes*** related to proposal review; and (B) the quality of the ***results*** of NSF's investments that appear over time. The COV also explores the relationships between award decisions and program/NSF-wide goals in order to determine the likelihood that the portfolio will lead to the desired results in the future. Discussions leading to answers for Part A of the Core Questions will require study of confidential material such as declined proposals and reviewer comments. *COV reports should not contain confidential material or specific information about declined proposals.* Discussions leading to answers for Part B of the Core Questions will involve study of non-confidential material such as results of NSF-funded projects. The reports generated by COVs are used in assessing agency progress in order to meet government-wide performance reporting requirements, and are made available to the public. Since material from COV reports is used in NSF performance reports, the COV report may be subject to an audit.

*We encourage COV members to provide comments to NSF on how to improve in all areas, as well as suggestions for the COV process, format, and questions. For past COV reports, please see http://www.nsf.gov/od/oia/activities/cov/covs.jsp.*

**FY 2006 REPORT TEMPLATE FOR**
**NSF COMMITTEES OF VISITORS (COVs)**

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| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: All nine BCS Programs** |
| **Division: BCS** |
| **Directorate: SBE** |
| **Number of actions reviewed: Awards: 398 Declinations: 411 Other:0** |
| **Total number of actions within Program/Cluster/Division during period under review: Awards: 1165 Declinations: 3716 Other:0** |
| **Manner in which reviewed actions were selected:**<br>**A random sample of 1 out of 3 Awards and 1 out of 10 Declines for FYs 2003, 2004 and 2005 was selected. From this sample, individual COV members review a subsection of 10-12 proposals.** |

**NOTE:**
All nine BCS Programs were evaluated concurrently on March 23 & 24, 2006. This is a combined report consisting of all of the disciplinary COV reports submitted for each program.

**2006 COV Members:**

Lila Gleitman, Ph.D., *Chair*

*Archaeology/ Archaeometry*
Clark Erickson, Ph.D.
Curtis Marean, Ph.D.
Deborah M. Pearsall, Ph.D.

*Cognitive Neuroscience*
Emmeline Edwards, Ph.D.
John Jonides, Ph.D.
Roberta Klatzky, Ph.D.

*Cultural Anthropology*
Benjamin Blount, Ph.D.
Leo Chavez, Ph.D.
Ann Kingsolver, Ph.D.

*Developmental & Learning Sciences*
Martha Arterberry, Ph.D.
Lynn Liben, Ph.D.
Valerie Reyna, Ph.D.

*Geography & Regional Science*
James W. Harrington, Ph.D.
John Kelmelis, Ph.D.
Douglas Richardson, Ph.D.

*Linguistics*
Joseph Aoun, Ph.D.
Susan Steele, Ph.D.
Orlando Taylor, Ph.D.

*Perception, Action & Cognition*
Morton Ann Gernsbacher, Ph.D.
Thomas Stoffregen, Ph.D.
Anne Treisman, Ph.D.

*Physical Anthropology*
Cynthia Beall, Ph.D.
Eric Delson, Ph.D.
Sara Stinson, Ph.D.

*Social Psychology*
Geraldine Downey, Ph.D.
Delia Saenz, Ph.D.
Michael A. Zárate, Ph.D.

# Introduction for the Division of Behavioral & Cognitive Sciences Committee of Visitors (COV), 2006

## *Respectfully submitted by Lila Gleitman, Chair of the 2006 BCS COV*

Currently, the Division of Behavioral and Cognitive Sciences (BCS) consists of nine disciplinary programs: Archaeology/Archaeometry, Cognitive Neuroscience, Cultural Anthropology, Developmental and Learning Sciences, Geography and Regional Science, Linguistics, Perception Action and Cognition, Physical Anthropology, and Social Psychology. The COV for this Division, consisting of 3 members from each program (and a chairperson) met March 23-24 2006 to assess NSF/BCS goals and performance in the period 2003-2005 under two broad rubrics: (A) the integrity and efficiency of the program review processes and (B) the quality and substance of results achieved. Both disciplinary and cross-disciplinary sessions were held to discuss and evaluate these matters. In addition, supplemental questions relating to internationality, diversity, and high-risk support were raised in break-out sessions and during a final meeting of the whole. The present summary (pages 1-6) is followed by a detailed report from each of the component disciplines constructed by the appropriate 3-person COV subcommittees. These disciplinary reports are organized within a Report Template provided for this purpose to the conferees by NSF. The remainder of this Introduction presents themes (both successes and problems) that recurred broadly during the deliberations of the individual disciplinary sessions of the COV.

### A. Programs and practices of BCS

The COV disciplinary committees severally and individually rendered a strong vote of confidence for the current (since 2004) Division Director of BCS, Peg Barratt, and for the Program Officers of the nine component programs working under her direction. The level of expertise, commitment, and efficiency of this senior staff is truly remarkable, and is deeply understood and appreciated by the COV. The resultant portfolio of funded research is – modulo the constraints of allocation and funding discussed below – exemplary. This much said, a number of practical and principled difficulties were noted by several and sometimes all of the disciplinary groups. What is somewhat discouraging is that by and large these issues closely match those described in the previous COV report (2002, chaired by Susan Steele).

**1. Program Directors:** Two main issues of concern emerged. First, the Program Officers are in general overworked and understaffed. The exceptions, naturally enough, are in programs with two PO's (e.g. Soc) or with firm plans to add a second PO (PAC). The presence of two PO's for other understaffed programs would support the achievement of several desirable outcomes, including greater rapidity of grant disposition and the assembling of a larger and more diverse contributing pool of reviewers. A third, related, benefit has to do with properties of the resultant portfolios of funded research. Under the present circumstances, the portfolio is very largely investigator-initiated: The review panels review whatever it is that they receive from individual investigators. Doubtless these topical choices are driven by fundamental developments in the underlying sciences; yet if the PO's had the time to attend more conferences and annual meetings of relevant learned societies, this would be a vehicle for discussing and publicizing more general strategic aims arising in NSF at the Division level, and could lead to increased coherence within and across the portfolios. As matters stand, PO's are generally too overburdened to participate in such activities. Remedies suggested closely parallel those offered by the 2002 COV: (1) add administrative support staff for the Program Officers, perhaps including (2) additional PO's assigned to work collaboratively with more than one of the panels; this latter seems especially reasonable given the cross-disciplinary nature (hence cross-reviewing) of a significant proportion of submitted proposals.

Perhaps even more pressing are issues consequent on the high proportion of rotators versus permanent PO's and, in practice, the unfortunately brief tenure of many of the rotators – sometimes

only one or two years. This problem was emphasized by almost every COV disciplinary panel. The new perspectives and enthusiasm contributed by rotators are of course welcome, and COV strongly supports continuation of this system of intermixing rotators and permanent PO's. The problem is in the proportions: too many rotators are in place and fully participating in decision making for too brief a time, and often after a too-brief period for orientation. As will be discussed further below, this contributes to a widespread lack of "institutional memory" in BCS, visible and damaging in a number of ways of which perhaps the chief is the inability to deal knowledgeably with "revise and resubmit" submissions. COV strongly recommends (1) an increased ratio of permanent to rotating PO's and (2) a longer period of overlap between incoming and outgoing rotating PO's to allow for orientation and integration of new PO's into the program. A further suggestion is for strategic planning workshops of standing PO's and support staff with former PO's and other disciplinary leaders.

**2. The review process:** Here too the COV rendered a strong vote of confidence for the review mechanisms and processes in BCS: Its activities and methods are widely acknowledged to constitute a gold standard of scientific review, including the useful intermix of panelist and ad hoc reviewers (of which, more below) and the sensibly spare and targeted use of site visits. But once more, this said, a number of problems were identified by the COV. And once more discouragingly, these problems heavily overlap those identified and discussed by the previous COV:

**(i) Constitution and work of the review panels:** Though in general the review panel constitution was deemed very good to excellent, the COV noted that panels were often understaffed, leading to too many proposals per panelist and in some cases an insufficiency in topical coverage. Moreover the COV noted the increased difficulty of attracting senior scientists to serve on these study groups and in several cases the lack of underrepresented groups among the panel members (it should also be noted, though, that BCS does not collect information on panelists – or ad hoc reviewers or, for that matter, grant submitters and recipients – that is full and accurate enough to allow for accurate assessment of matters concerning representiveness. If NSF wants diversity measured, they will have to construct and maintain a database that will allow it). An additional suggestion concerning review panels was that in some cases members of NGOs and businesses might add to the expertise and diversity of panel membership.

**(ii) Ad hoc reviewing:** The problems in this regard once more echo those observed and commented on by the previous COV. The return rate of ad hoc reviews is disastrously low and falling, except in a few cases in which individual PO's made superhuman efforts in casting the net, cajoling, and follow-up. Moreover, there was considerable variation in the thoroughness, expertise, and timeliness of those ad hoc reviews that were received. A number of remedies to the problem of soliciting and using ad hoc reviews were proposed by members of the COV. These included (1) automated reminders of due dates; (2) personal telephonic or mail contact from the PO, including emphasizing that this person's particular expertise is crucial for the particular case. Further remedies were addressed to making participation more rewarding for the ad hoc reviewer. These included (3) thank you notes to university administrators for the efforts and contributions of ad hoc reviewers in their faculty, (4) urging that regular ad hoc reviewing receive a line on CV's, just as does membership in study groups and regular reviewing for journals, (5) telephonic contact with and involvement of the ad hoc reviewers during the study-group meetings, (6) notification to ad hoc reviewers of the outcomes of proposals on which they commented. Summarizing, ad hoc reviewers receive little recognition or further involvement for their participation. Thus under present arrangements they send their reviews, so to speak, into the void. This situation, while difficult, doesn't seem wholly intractable though some COV members did recommend dropping the ad hoc reviewing process altogether.

**(iii) Reporting to applicants:** There was a considerable range of opinion across the disciplinary reports on the adequacy of feedback to grant applicants. A particular concern is the panel

summaries. While some divisions found them useful, detailed, and well focused, in other cases they were judged to be perfunctory or inadequate to guide the revision and resubmission of unfunded proposals. This is a matter of special concern as it interfaces with the problem of rotators: When the panel summary is relatively uninformative and the original PO for the submission is no longer with NSF, the notion of revise and resubmit and lose much or all of its meaning. A measure of this problem is that some COV members could not tell from reading the panel summaries (except for the very highest and very lowest ranked proposals) which of them in fact were funded. The appropriate remedies here are clear: Applicants need guidance concerning the grounds on which their proposals failed and the direction that resubmissions should therefore take. One important suggestion in this regard is to increase the number of questions/headings in the report templates received, especially by ad hoc reviewers; these headings and questions serve as organizing response categories that make the resultant reviews more coherent, consistent, and topic-inclusive, in turn providing better information for the PO in constructing the panel summary.

**(iv) The portfolios: Merit:** In general the COV was enthusiastic about the quality and diversity of proposals funded, and the responsiveness of the portfolios, overall, to the evolving state of science in the various disciplines. This assessment was not uniform, however. For example, in some rapidly emerging areas, adjustments among funding priorities were not judged sufficiently nimble. One instance is Cognitive Neuroscience where past funding has appropriately emphasized technology development (fMRI) but it is now felt that a shift toward more substance-oriented proposals is warranted as the field matures. Another pressing issue concerns the size of the awards. Several disciplinary assessments by the COV were that the awards were too small and their time period too short to complete the proposed research meaningfully. There are obviously delicate problems of balance here that NSF staff has to approach with considerable thoughtfulness. When awards are small and short, the proportion of seed-type proposals (and, hence, youngest investigators) rises. When large grants are favored, this tends to squeeze out all but the most mature and extensive projects and senior scientists.

**(v) Merit – continued:** COV members for almost all the disciplines were alarmed at the low percentage of proposals – among those considered good science and therefore deserving – that actually were funded. When these percentages become too low the portfolios lose coherence and come to have an arbitrary component, like winning the lottery. Congressionally recommended increases in the NSF (and SBE, in particular) funding levels – at least as foreseen at the time of the COV meeting – of course can remedy these problems. But at the current level of funding there are dangers such as making awards too small to do the job (see (iv) above), or too narrow in scope and unambitious to serve scientific advance appropriately. In general, the low proportion of fundable grants that actually received support is so low as to be wasteful of scientific resources: too many serious investigators spending inordinate amounts of time (considering the likelihood of funding) writing proposals that simply cannot be supported. Too many minds chasing too few dollars.

**(vi) Merit – continued**: Several if not all the BCS disciplines are topically and methodologically interlocked. The COV compliments the PO's for their responsiveness to this factor, reflected most generally in the assignment of co-reviewing responsibilities and awards across more than one disciplinary panel. Perhaps this is best expressed as the exemplary absence of turf wars across the disciplines comprising BCS, at least within NSF.

(**vii) Merit – continued:** A desideratum in BCS is the funding of some proportion of high risk proposals. There is considerable confusion about what "high risk" means, however, and this varies from discipline to discipline. For example, the Archaeology panel can readily define "risk" in terms of, e.g., unexcavated or test sites, but criteria are not so ready to hand for several other disciplines. Moreover the very hard-edged criteria that panels are empowered to use as judgment criteria tend to militate against the funding of proposals that, by their especially innovative and novel nature, cannot

meet such standards. This is especially so when the proportion of deserving proposals that can be funded is so low. The COV suggests that dedicated, or at least partly separate, panels be constituted to search out and evaluate high-risk proposals, supported through a special funding pool.

**(vi) Dissertation proposals:** Dissertation support and improvement proposals were judged by COV to be generally too small to meet their recipients' needs and purposes. Almost unanimously, members for the several disciplines recommend a rise from $12,000 to $15,000 or $16,000.

**(vi) Broader Impact:** There is significant confusion and disagreement among applicants, reviewers, panelists, and the COV as to the meaning of "broad impact." Once more, this is a problem duly noted by the previous COV. Is this impact to be on practitioners, students, the science, science generally, society, allied concerns such as education, work-force, and so forth? Because nobody quite knows and because sensible answers vary exceedingly from proposal to proposal and from discipline to discipline, this criterion often is satisfied only by lip-service at all levels. Some COV members point out that the reverse problem can also arise. This is where the criteria for best science can conflict with criteria of "impact" (and of "diversity," "multidisciplinarity" "national goals and priorities," etc). Some considerable attention must be paid to the fact that "broader impact" is, reasonably enough, desired by NSF as a matter of public policy and responsibility and yet there is no clarity about what constitutes such impact. Without this, statements of broader impact tend to become boiler-plate inclusions in each proposal for funding, absent the intended goals and merits. One COV proposed remedy is for the empanelling of a special review committee drawn from BCS and its various constituencies to formulate some (broad and not overly restrictive) policy on these matters.

**B. Accomplishments**

As noted in preliminary remarks, the research being accomplished under the rubric of BCS is in the opinion of the COV, exemplary in many regards. Subcommittees and individual members of the COV repeatedly (though of course with spotty exceptions), commended the portfolio of awards for breadth of coverage within and across the BCS sciences, interdisciplinarity, inclusion of transformative research and newly emerging scientific issues and questions, responsiveness to national and societal goals and aspirations, and international perspectives (including multilingual expertise). Particularly, many of the disciplinary components of BCS are education and health related in virtue of their topic areas and thus contributes information and practice to the public good almost as an automatic outcome of their scientific inquiries. Related conclusions apply on issues concerning maintenance and improvement in the physical, economic, and social environment as well as understanding of and responsiveness to the broad problems of natural catastrophes, globalization, and terrorism.

The balance of geographical distribution of PIs and of institutional types funded under the BCS programs was judged on the whole to be appropriate and satisfactory, with the special exception of the inclusion of underrepresented groups. As we noted, this last matter poses significant problems for COV even to evaluate just because BCS and probably NSF as a whole does not, and probably cannot, generate the appropriate database of grant applicants (and, separately, successful grant applicants), participant graduate and undergraduate students, and study-group and ad hoc reviewer participants. But even in the absence of codified information on this topic it is clear that many of the BCS component disciplines woefully under-represent the diversity of the American population, an under-representation that reflects inequalities in the scientifically educated citizenry and is reflected, in turn, in the nature of the funded portfolios. There was a range of opinions within COV as to directions for remediation, many of these specific to the work of individual disciplines (and discussed in the disciplinary reports that follow, usually under the heading of "people outcomes"). A widely-held position was that continued efforts in the pipeline are where these issues can often be most profitably addressed. This means a continued emphasis on, and support of, science training at all

levels of the American school systems, beginning with K-12 education but continuing through the undergraduate levels. In this regard, a specific recommendation was to extend the tenure of undergraduates in the REU program so that they could enter and remain in laboratories for a meaningful length of time (a semester, at minimum, rather than just a summer as is now often the case). This would allow undergraduate participants to be integrated as functioning members of a working laboratory in a way that is useful both to them and to the mentoring scientific community.

**Briefly concluding:** The COV found the BCS programs to be impressive and successful in most of the ways that really matter. These include the expertise and commitment of NSF staff and of the reviewing bodies that they enlist; the consequent richness and breadth of scientific inquiries funded under these programs; and the national priorities that these sciences address and respond to. Nevertheless, there are several niggling problems of management and practice. This COV, like almost all watch-dog and consultative committees, necessarily ends up devoting more of the space in their reports to what is imperfect and in need of revision or improvement than to what is perfect (or close to perfect).

The main cautionary note in our largely optimistic report is that many of the same problems and perplexities resurface and remain at least partly unresolved as reported by two COV's convened three years apart.

# Archaeology/ Archaeometry

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| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: ARCHAEOLOGY/ ARCHAEOMETRY** |
| **Division: BCS** |
| **Directorate: SBE** |

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

### A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[1] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br>Comments:<br><br>We recommend the Program Director to re-consider the current 2-part classification and coverage of the panel, which currently focuses on representation based on geographic area and level of social complexity (hunter-gatherer, complex society, etc.). As methods become more complex, we suggest adding a third set (perhaps 3 people) whose membership is based in method. However, we do not recommend a dramatic increase in the size of the panel. | YES |
| 2. Is the review process efficient and effective?<br>Comments:<br><br>**Regular Grants** - The low response rate of the selected ad hoc reviewers for regular grants and dissertation improvement grants is disturbing (cite figures here). We recommend the Program Director to send all referees an automated reminder after 30 days. We also suggest that the Program Director consider asking potential referees for a commitment to review and requiring a response confirming or declining the commitment to review within a week. The Program | YES |

[1] If "Not Applicable" please explain why in the "Comments" section.

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| Director may decide to test this strategy with ad hoc reviews of Dissertation Improvement Grants before applying it to all grants.<br><br>**Dissertation Grants** – We reviewed most of the proposals and associated Reviews, Panel Reviews, and Panel Summaries for Archaeology and Archaeometry provided to the COV. The review and decision-making process is fair, clear and well justified. Yellen does an excellent job of bringing dissertation proposals through the system in a timely fashion. Grantees can begin their projects soon afterwards and declined proposals of high value can be rewritten and resubmitted for consideration. *The process should not be changed.*<br><br>To insure sufficient reviews and possibly shorten the turn around, the we recommend that the Program Director ask ad hoc reviewers for a commitment to review (giving them a maximum of a week to decide on commitment), and automated reminder after 30 days would be helpful for tardy reviews.<br><br>We recommend that the Program Director, possibly in collaboration with colleagues at similar granting institutions, write a short essay about the professional and ethnical responsibilities of serious peer reviewing and the importance of review quality for the AAA Newsletter and the SAA Newsletter. We also support the innovative ideas suggested by COV colleagues for encouraging compliance with reviews and rewarding effort, such as sharing review compliance data with reviewers so that they can use this for annual faculty evaluations. | |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?<br>Comments:<br><br>We were impressed with the quality and fairness of the majority of individual ad hoc and panel reviews. Some reviews are rather superficial and of little use. We recommend that the Program Director, possibly in collaboration with colleagues at similar granting institutions, write a short essay about the professional and ethnical responsibilities of serious peer reviewing and the importance of review quality for the AAA Newsletter and the SAA Newsletter. | YES |
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br>Comments:<br><br>As we understand the process, one purpose of the panel recommendation is to inform the grant applicants why they did not get funded. Given that narrow definition, the panel summary is sufficient. However, to be of value to applicants whose proposals could be revised and resubmitted, the reviews should provide clear and specific comments. As noted above, this is not always the case. | YES |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br>Comments: | YES |

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| The Program Director is very helpful in communicating to the grant applicant the basis of the decision, and providing direction on review and resubmission. | |
| 6. Is the time to decision appropriate?<br>Comments: | YES |
| 7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:<br><br>The Program Director asked our guidance on classical and historical archaeology in the context of dissertation improvement proposals. We think that these proposals should be held to the same accepted anthropological standards of theory and methodology as other proposal within the program. | |

## A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[2] |
|---|---|
| 1. Have the individual reviews (either mail or panel) addressed both merit review criteria?<br>Comments: | YES |
| 2. Have the panel summaries addressed both merit review criteria?<br>Comments: | YES |

[2] In "Not Applicable" please explain why in the "Comments" section.

4. Additional comments with respect to implementation of NSF's merit review criteria:

Intellectual merit is effectively addressed by a combination of ad hoc and panel review. Ad hoc reviewer effort is best spent on intellectual merit, rather than comments on broad impacts, which may only be clear long after the research is completed.

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| **SELECTION OF REVIEWERS** | **YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[3]** |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br><br>Comments:<br><br>We did not observe any specific situation where a proposal received an unfair evaluation though the lack of reviews. However, we do note a decline in review compliance which could present problems in the future. Relying on only 3 reviews for regular proposals is risky and we recommend that this should only be done when all three are consistent. Efforts should be made to increase the number of reviewers for regular proposals. Please see our comments above about improving review compliance and quality. | YES |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br><br>Comments:<br><br>As archaeological theory and methods become increasingly sophisticated and multidisciplinary, an expanded pool of potential reviewers will be needed. In addition, the panel composition will have to represent the disciplinary breadth of the discipline. | YES |
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[4] | YES |

[3] If "Not Applicable" please explain why in the "Comments" section.

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| Comments:<br><br>There is a good spread of reviewers across the United States, and even though the reviewer pool is tilted toward Research 1 universities, there is a good selection of non-Research 1 universities. | |
| 4. Did the program recognize and resolve conflicts of interest when appropriate?<br>Comments: | YES |
| 5. Additional comments on reviewer selection:<br><br>None | |

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[5], OR DATA NOT AVAILABLE |
|---|---|
| 1. Overall quality of the research and/or education projects supported by the program.<br><br>Comments:<br><br>Archaeologist are conducting cutting-edge research and this is well illustrated in the "Nuggets". Archaeologists are also leaders in conducting research of broad interdisciplinary reach. The success of archaeologists in highly competitive Biocomplexity and HSD grants reflects this success. If these programs term, archaeologists need to have access to similarly well-funded interdisciplinary funds where the funded grant budget can be larger than the typical archaeology award. | APPROPRIATE |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br>Comments: | APPROPRIATE |

[4] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

[5] If "Not Appropriate" please explain why in the "Comments" section.

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| The total number of applications for regular archaeology grants from 2003 to 2005 has risen from 128 to 175, while success rate has plummeted from 34% to 15%, suggesting an extreme strain on the budgets research costs rise and more faculty apply for external funding. Archaeometry has a higher success rate, but is also declining. Average award per year for archaeology grants has remained steady at about $105,000. Combined with the eventual demise of Biocomplexity and HSD (see above), we predict a crisis strain on the archaeology program's budget in 2-3 years time.<br><br>The dissertation improvement proposals have a high success rate coupled to a tendency for the budgets to be at or near the maximum. The fact that most budgets are near the maximum allowed amount suggests that students are not finding this sufficient to conduct the research. However, we find that the proposal quality is high, thus we do not recommend reducing success rate.<br><br>For many years, the maximum award for dissertation improvement grants has been capped at $12,000. We recommend that the maximum award should be raised, because research costs have increased (for example transportation, per diem, specialized analyses, conservation). Specialized fixed cost analyses such as botanical and faunal analysis are now mandatory in many archaeological studies.<br><br>We recommend an immediate raise to $15,000, and a regular re-evaluation that considers indices such as inflation and gross program budget to avoid the need for dramatic raises in the future. We would also suggest targeting new funds for dissertation grants. | |
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[6]<br>Comments:<br><br>The High Risk program fulfills a valuable role. One concern is that the program is poorly known and misunderstood. In archaeology, high risk is traditionally understood as involving reconnaissance of previously unexplored areas, and test excavations of unexcavated sites. We recommend that this definition be expanded to include transformative research such as projects that challenge conventional wisdom and push the edges of theory and method. | APPROPRIATE |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br>Comments:<br><br>For example, the HOMINID program targets multidisciplinary projects with a focus on human origins. We noted that in 2006, few proposals were | APPROPRIATE |

[6] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

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| submitted. This could result from a lack of understanding of what is appropriate research for the competition, and a general intimidation among archaeologists and paleoanthropologists to apply for such a large amount of funds so far above what they typically apply for. Archaeology would benefit from a website promoting the program and providing more information about the research agendas, scope, and examples of successful proposals. We encourage the Program Director to consider providing an opportunity for potential applicants to submit a pre-proposal.<br><br>Few HOMINID proposals are submitted with archaeologists and physical anthropologists as the collaborators. We found this surprising given the original intent of the program. We encourage the Program Director to encourage such collaboration.<br><br>Scholars agree that many of the great moves forward in science have and will occur at the interfaces of the currently defined traditional sciences. A key question then becomes how do we create adequate infrastructure, support, and incentive to encourage scientists to explore that interface, given the difficulties in doing so, and the risk involved. Although Program Director Yellen has been instrumental in making non-archaeology funding opportunities known outside of the Archaeology Program within NSF, many colleagues have a limited knowledge of these sources.<br><br>University administrations have responded in several ways by creating seed money grants for transdisciplinary research, grouping departments into schools, and so on. NSF has as well, for example with the Circum-Polar program, and the Biocomplexity programs. The former tries to reach that synergy around a common ecological parameter – cold latitudinally high ecosystems. The latter is driven by a broad theoretical issue – how to explain complexity, its origins, and evolution, and function.<br><br>The COV noticed that the reviews for HOMINID vary widely in character, and there are more than is typical for the regular grants. This means that the job of the panel is rather complex. To date we think the panels have done an excellent job.<br><br>Impediments to interdisciplinary research still exist, particularly in the deep past where humans are involved. HOMINID is perfectly placed to accomplish this goal. We believe that similar initiatives that perhaps target more complex societies, historical ecology, and landscapes could follow and benefit from the model of HOMINID. | |
| 5. Does the program portfolio have an appropriate balance of:<br>• Funding for centers, groups and awards to individuals?<br>Comments: | APPROPRIATE |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators? | APPROPRIATE |

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| Comments:<br><br>There seems to be a fair number of young scholars in the award pool. | |
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br>Comments: | APPROPRIATE |
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br>Comments: | APPROPRIATE |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br><br>Comments:<br><br>We note that the applications for REUs seem to be well below what we would expect. This misses the opportunity to recruit talented undergraduates into science, including those from underrepresented groups. Grant awardees should be encouraged to take advantage of this program.<br><br>It is our perception that graduate students are well integrated into the project research. It is less that clear that there are adequate funding levels for these students. | APPROPRIATE |
| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities?<br><br>Comments:<br><br>The proposal portfolio displays a great richness of topics and coverage, as well as traditional and newer ideas. | APPROPRIATE |
| 11. Does the program portfolio have appropriate participation of underrepresented groups?<br><br>Comments:<br><br>Although we have no data on the representation of underrepresented groups in the field of archaeology, we believe that it is quite low, and this is reflected in the award distribution.<br><br>The program continues its awarding of summer fellowships to Native Americans through the Society of America Archaeology. Another approach | NO DATA |

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| is the use of targeted REUs such as the REU Site Grant for Native Americans at University of Pennsylvania. | |
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br><br>Comments:<br><br>The agency mission of NSF is to fund basic research, and the portfolio of awards clearly meets this need.<br><br>Archaeology meets the customer needs of American citizens in that archaeology continues to be of extreme public interest, and the archaeology program funds much of the research that feeds that citizen consumption of archaeological information. There are numerous examples, but one well-known example is the research at Teotihuacán that has received widespread media coverage and public interest.<br><br>Archaeology and the projects funded by the Archaeology program are very successful at integrating students into research and science. | APPROPRIATE |
| 13. Additional comments on the quality of the projects or the balance of the portfolio: | |

**A.5 Management of the program under review**. Please comment on:

1. Management of the program.

Comments:

The management of the program is excellent. The Program Director makes good use of the panel: discussions are free-ranging and not overly structured; panel recommendations are taken seriously; he uses his judgment when necessary (ie when no consensus is reached).

Our Program Director provides superior feed back to applicants, both in the concise distillations of the rationale for panel decisions that he provides, and through follow-up conversations concerning strategies to improve proposals for resubmission.

His role in the development of the HOMINID program is a notable achievement, and greatly appreciated by the discipline. This effort significantly contributed to interdisciplinary research in archaeology and related disciplines. In the cross-discipline COV discussions it was suggested that the Program Director can play an important role in guiding the panel in cases of innovative proposals that might fail because they challenge conventional wisdom, fall at the edges of the discipline, and/or

apply new theory and method. We trust that the Program Director will continue his leadership in fostering interdisciplinary research by taking this suggestion.

2. Responsiveness of the program to emerging research and education opportunities.
Comments:

The program has been active in responding to emerging research and education opportunities.

For example, the Archaeometry program funds merging technologies and their application to archaeology, and beyond. Archaeology makes a significant investment in Dissertation Improvement grants, and these enrich education and training of graduate students. Graduate students are usually on the cutting edge of research, and that helps support emerging research. The High Risk grants program also helps fund emerging opportunities.
Archaeology by its nature is interdisciplinary, and the program has consistently been receptive to this type of research and has funded it well.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.
Comments:

The Archaeology program has a simple system of ranking that carefully considers ad hoc reviews, panel reviews, and significance of work. This system works effectively.

4. Additional comments on program management:

In the report above, we have made several specific recommendations. Much of this revolves around monitoring and facilitating review compliance. All of these, if implemented, require increased staff support. *We strongly recommend addition of staff support to archaeology.*

## PART B. RESULTS OF NSF INVESTMENTS

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

## B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

**B.1 OUTCOME GOAL for PEOPLE: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

Comments:
Archaeology has excelled at providing Dissertation Improvement Grants for future scientists (averaging about 100 per year), and through this commitment has built an outstanding community of scientists and teachers in archaeology.

Though we have no specific data on this, our qualitative review of the proposals suggests that young scholars are well supported. The regular support of young scholars through regular research grants has provided excellent follow-up to the support for dissertation research.

**B.2 OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."**

Comments:
Global change, both gradual and catastrophic, is now becoming a major research initiative of key significance to national security. Archaeology is joining other disciplines in examining environments and climates over the long term for understanding global, regional, and local signatures. Of special interest is concern for human response to past global changes (e.g., drought) and catastrophes (e.g., earthquakes, tsnumanis, floods). In addition archaeologists can contribute to an understanding of anthropogenic impacts on environments and sustainable technologies. The archaeology program has done an excellent job funding these projects, and below we provide three examples (much of

this is drawn from the “Archaeology Nuggets Document”).

**Earthquakes, Tsunamis, and Long Term Human Response**
*NSF Award Numbers:*
9907019
Award Title: Archaeology of the Cascadia Subduction Zone: Cultural Responses to Coseismic Subsidence, Tsunamis, and Earthquakes on the Southern Northwest Coast
PI Name: Madonna Moss
Institution Name: University of Oregon Eugene
PE Code: 1391
Just recently a major tsunami devastated vast areas of southeast Asia, killing over 100,000 people, and had an enormous impact on the global economy. Archaeological data from the Northwest Coast of the US, as well as other parts of the world, provide an excellent source of information for understanding human and environmental response to specific major impacts because they allow construction of a diachronic picture with establishment of a pre-event baseline as well as reconstruction of both immediate and long term post event response. Coastal earthquakes and tsunamis have not only dramatic short term effects – destruction of property and human life – but pervasive longer term impact as well, in the form of basic environmental change which results from changes in relative sea level. This project used archaeological and geological information to examine how people in the past on the Northwest coast were hit and responded to a major tsunami. Such studies can help us plan for future catastrophic events such as tsunamis.

**Coevolution of Human Societies and Landscapes in the Core Territory of Late Shang State**
*NSF Award Numbers:*
0090179
Award Title: Co-Evolution of Human Societies and Landscapes in the Capital Territory of Late Shang State (Phase II)
PI Name: George Rapp
Institution Name: University of Minnesota-Twin Cities
PE Code: 1391
To understand both the environmental changes that occurred during the reign of the Shang and the cultural context in the surrounding region the project embarked on a systematic survey integrating traditional survey methods, core drilling to understand the third dimension, and laboratory analyses [e.g. sediment analyses, high-resolution pollen analyses, and ceramic petrography] to detail environmental and cultural evolution. The researchers have been able to identify a stratigraphic sequence of lake, swamp, and alluvial deposits from bottom to top. The results of the ongoing pollen studies will provide a much better understanding of the paleovegetation and paleoclimate than has been available for this region of China. With the project results the coevolution of the Shang society within its changing environment is emerging. These kinds of understandings provide us with valuable information on how modern societies can respond to future climate change.

**Climatic Change and Human Response**
*NSF Award Numbers:*
9727355
Award Title: Archaeological & Environmental Investigation of Yemeni Terrace Agriculture
PI Name: Tony Wilkinson
Institution Name: University of Chicago
PE Code: 1391
Because significant numbers of people who follow traditional lifestyles live in semi-arid regions subject to highly variable and unpredictable rainfall; famine, death and population dislocation are recurrent threats. Scientists therefore wish to understand relationships between climatic change at varying time scales, population density, subsistence practices, and human resiliency. Because

archaeology can track these variables over long periods of time - often measured in millennia - it has substantial insights to offer. Dr. Tony Wilkinson and his colleagues are pursuing long term research in semi-arid regions in Yemen on the southern tip of the Arabian peninsula to accomplish this goal.

**B.3 <u>OUTCOME GOAL for TOOLS:</u> Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

Comments:
Archaeologists are often leaders in developing novel methods to research, and the archaeology program has excelled at funding this type of research, particularly with the Archaeometry program. Below we provide two such examples.

**Development of a Down-hole Magnetic Susceptibility Logger and Soil Magnetic Laboratory for Archaeological and Soils Investigations**
*NSF Award Numbers:*
0215723
PI Name: Rinita Dalan
Institution Name: Minnesota State University Moorhead
PE Code: 1189
In this award the PI developed a downhole susceptibility logger which utilizes variation in soil magnetic properties to detect past human presence. The technique rests on the assumption that human activities, even at a hunting and gathering level of behavior, affect soil surface properties and that by examining variation in magnetic susceptibility across such stratified surfaces promising excavation localities can be pinpointed. The process itself, which involves vertical coring to produce a small hole and then lowering a sensor into it is relatively inexpensive and rapid. This technique could have clear application to many other disciplines.

**Monitoring Prehistoric Human Mobility: Isotopic and Elemental Characterization of Skeletal Tissues**
*NSF Award Numbers:*
0075231
PI Name: T. Douglas Price
Institution Name: University of Wisconsin-Madison
PE Code: 1393
In this award the PI developed methods to determine regional biological signals and to measure strontium isotope ratios in mammalian tooth and bone. The research has provided an extremely powerful and broadly applicable technique to address a wide range of questions. For example, through analysis of their skeletons one can determine which Icelandic Vikings were born on that island and which, in contrast, retain a childhood Scandinavian isotopic tooth signal. The team's work also shows that agriculture entered central Europe not as a disembodied idea but rather in concert with new groups of people. Another study involved identifying the distant place of birth of an early Maya king who founded the dynasty at the important site of Copan. This technique could have many applications in other disciplines.

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[7]**

Comments:

(1) operation of a credible, efficient merit review system: We believe that the merit review process of the Archaeology Program operates in an efficient manner. We are concerned about the low response of colleagues to requests for ad hoc reviews. As discussed above, we present specific recommendations.

(2) utilizing and sustaining broad access to new and emerging technologies for business application: Fastlane and ejacket are both useful innovations.

(3) developing a diverse, capable, motivated staff that operates with efficiency and integrity: In our personal experience, we have found the staff highly motivated, capable, and helpful. Program Director Yellen in particular is an incredible resource. Because of his long tenure as Program Director Yellen provides continuity and critical institutional memory. We feel that the Program Director could use more staff support.

(4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness: We have concerns that there are no mechanisms in place to assess the short and long term investment of NSF funded research. For example, does a dissertation improvement award increase the chance of the dissertation being completed and success in the job market? Does a regular award increase the likelihood of promotion and tenure and future funding success? Measuring publication and citation output from grants. A mechanism for long-term follow up is needed.

# PART C. OTHER TOPICS

## C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

The program director asked us if there should be any major changes to the distribution of funds between the four sub-programs. We do not recommend any major changes. However, above we have recommended that dissertation grants be raised to $15,000. We also suggested greater support for REUs. Both could effectively shift funds away from regular grants and archaeometry grants. To minimize the impact on these sub-programs, we suggest that new funds be used to raise the maximum award for dissertation improvement grants and fund more REUs.

## C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

Nothing to add.

[7] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

**C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.**

Education and public outreach must play a critical role in the future of science. NSF could help individual programs by providing funding, staff, and technical support for efforts to increase public awareness of the science funded by NSF. For example, NSF initiates a public oriented website to promote the results for each awarded project in non-technical language, graphics, streaming video, and photographs. This should complement a more scholarly website with technical summaries and publications in pdf format.

**C.4 Please provide comments on any other issues the COV feels are relevant.**

Nothing to add.

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

More data on outcomes from awarded grants.

**SIGNATURE BLOCK:**

Curtis W. Marean
Deborah M. Pearsall
Clark Erickson

_____
For the 2006 BCS COV

# Cognitive Neuroscience

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| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: COGNITIVE NEUROSCIENCE** |
| **Division: BCS** |
| **Directorate: SBE** |

PREFACE The Cognitive Neuroscience Initiative (CNI) has now been in existence for 5 years, during which time it has been under the direction of three program officers. Over that period, there have been profound changes in the field of cognitive neuroscience. Once used rarely, fMRI has become a staple of research in the area, and the number of journals devoted to this methodology has burgeoned. Advances in the basic technology have slowed, but new developments for analysis continue. New techniques such as TMS have shown a similar cycle from novelty to common use.

Over its history, CNI has played a somewhat unique role in the SBE portfolio. The substance of its research is shared with other programs, including perception/action/cognition, language, emotion, and social psychology. CNI's unique role is to emphasize the combination of behavioral science with neuroscience methodologies that are powerful, but far more expensive than traditional methods. The balancing of methodological and substantive interests is apparent in CNI's tendency to review proposals collaboratively with other programs. Proposals in which CNI takes a primary interest would often not fare well if reviewed exclusively by other programs, due to their relative expense and the skew toward interest in brain mechanisms relative to pure psychological issues.

As the pace of methodological change has slowed, and the substantive issues within cognitive neuroscience have become better articulated, the nature of proposals funded by CNI has gradually changed. The review panel sees the current portfolio as having considerable overlap with cognitive neuroscience at NIH. The high-risk methodology component of the portfolio has shrunk. To a certain extent, these changes have been implicit. As such, they are not fully recognized in the construction of the CNI review panel and the stated mission of CNI. With the shifts in funding at NIMH to transitional, disease-related research, there will be more pressures on NSF, and CNI in particular, to accommodate basic behavioral research that takes a neuroscience approach.

These changes, gradual and implicit or sudden and explicit, make this a particularly important time to convene a COV for CNI. We believe that CNI should undertake a self-assessment with the goal of defining its mission and practices. This is likely to lead to a more proactive approach to developing research, as well as to developing a pool of researchers with appropriate diversity.

CNI has been fortunate to have directors with vision and energy. However, the rapid turnover in the directorship has not occurred without costs in terms of NSF's stated goals of nimbleness and innovation.

These considerations lead our committee to a series of recommendations:

- Increase the term of office for the program director beyond the typical term of 1-2 years for rotators to provide greater continuity
- Provide greater representation of senior scientists on review panels
- Elaborate Broader Impact section so that it is clear what contributions are valued
- Increase the value of the ad hoc reviewers' contributions by, e.g., having them participate in review more fully via telephone
- Explore ways to increase the response rate of ad hocs
- Increase the size and length of awards to provide sufficient funds to meet appropriate conditions of statistical power

• Maintain high standards of scientific excellence even while recognizing other criteria that may come into play in making funding decisions
• Shorten the review cycle by one month
• Introduce a "revise and resubmit" mechanism for resubmitted applications
• Create a new Program Announcement that emphasizes the value of work on substantive topics as opposed to technique development
• Create a strategic plan for the expected new infusion of funds in the coming years that especially recognizes the opportunities that will be created by the NIH Roadmap initiative
• Create a new review template that will lead to more explicit criteria to reduce disparity among reviews
• Continue to co-review most Cognitive Neuroscience proposals with relevant substantive programs.
• Create mechanisms to increase the number of underrepresented groups in the pipeline rather than changing criteria of scientific excellence in order to increase number of funded proposals by underrepresented groups.
• Add a checkbox on reviewer forms to allow them to self-identify conflicts of interest
• Stage in new infusions of funds so that the funds are not spend out for future years

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

### A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[8] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br>Comments:<br><br>The COV members are concerned about the composition and size of the panel. While the COV members recognize the value of bringing fresh ideas and appointing new investigators to the review panel, there was a definite lack of balance between experienced and junior investigators. All three COV members could not readily identify many of the panelists. Moreover, there has been a great deal of turnover in panel membership. This is particularly troubling since the program has been under the leadership of three Program Officers over a five-year span. | NO |

[8] If "Not Applicable" please explain why in the "Comments" section.

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| In response to the program announcement, an emphasis was placed on staffing the panel with methodologists. Here again a better balance needs to be established between cognitive scientists, neuroscientists and methodologists, particularly as methodology begins to play a smaller role in the overall portfolio.<br><br>Similar concerns are raised with respect to the ad hoc reviewers' expertise and experience. It was apparent in the majority of the cases that we examined that the ad hoc reviewers' comments were not aligned with the panelists' comments and that these ad hoc reviews had little impact on final funding decisions. The response rate from ad hoc reviewers averaged about 35%, and the COV would suggest a systematic evaluation of the value added by this process. At the very least, some mechanism needs to be put in place to increase the rate of return by ad hocs (see #2 below). We have other suggestions below as well that might mitigate the use of as many ad hocs as are currently used. | |
| 2. Is the review process efficient and effective?<br>Comments:<br><br>A major issue is related to the impact of ad hoc reviewers on the NSF system.<br><br>The COV members recommend that a more personalized approach be adopted to increase the response rate from ad hoc reviewers. The use of telephone reviewers could provide an alternative approach. These reviewers would be treated as panel members with access to the proposals and the reviews. This would greatly change the dynamic of interaction for the reviewers, raise the profile of their involvement and increase the value attached to this service to NSF and the scientific community.<br><br>Some concerns were also raised about the apparent weight of one or two panelists on the final funding decision. The COV members want to highlight that the current PO did a remarkable job convening the first panel, given that he walked in the door in October and had a panel meeting in December.<br><br>The last COV had recommended that the review cycle be shortened, and this recommendation is still relevant. The current COV members also recommend a shorter time period between the submission of a proposal and a final decision. At the same time, it is important that the panelists have access to ad hoc reviews in advance of the meeting. This will necessitate a timely call for ad hoc reviews. | YES |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?<br>Comments:<br><br>There is great disparity in the depth and content of the reviewers' statements. The reviews from panelists tend to be more thorough and informative, whereas those from ad hoc reviewers vary a great deal. In addition, the level of | NO |

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| understanding and assigned importance of the "Broader Impact" section was often weak in the reviews. The group recommends a more structured review template to guide the reviews and to add consistency to the process. The broad division into scientific merit and impact is insufficient.<br><br>In many of the proposals examined, the review analysis indicated that the Program Officer viewed diversity of opinions as an indicator that the PI needed to resubmit. The COV members do not share that view and encourage more specific recommendations that could be further communicated to the PI and be used to improve the application. | |
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br>Comments:<br><br>In general the panel summary was informative and reflected the discussion of the panel. However it was noted that there were not enough details when there was no consensus about the critical issues that would guide the PI in a resubmission. Perhaps part of the problem is that panel summaries are prepared by panelists on the fly, while they are at the same time trying to track the discussion of the proposal and trying to prepare for the next review. This hardly seems an optimally procedure. | YES |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br><br>Comments:<br><br>Review analyses were generally excellent, although when there was controversy, there was often insufficient justification for the final decision. | YES |
| 6. Is the time to decision appropriate?<br>Comments:<br><br>The previous COV report requested a shorter time from submission to final decision, but there has been no apparent change in the timeline between submission and final decision. The COV members recommend shortening the time by at least a month. The caveat is that the ad hoc reviewers would have to be recruited immediately so that their reviews are available ahead of the review meeting and so that these reviews can be digested by the panelists well before the panel meeting. | NO |

7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:

Currently there are no formal mechanisms for PIs to respond to previous reviews and build on them. Each review is an independent event. This differs from the NIH review process, where investigators are allowed to provide a rebuttal to the comments and an opportunity to demonstrate how the proposal has been revised. The COV members recognized that the lack of continuity on panel membership and PO makes a revision less practical in the NSF system. However, the COV still recommends that the PI be allowed to add 1-2 pages to a revised application in order to respond to previous reviews or perhaps to submit a cover letter with a revised application.

In the group of applications that were examined there was some evidence that other NSF considerations (e.g., funding small colleges, involving underrepresented students, developing new technological innovations) might have mitigated the quality of judgment about the scientific work itself.

## A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[9] |
|---|---|
| 1. Have the individual reviews (either mail or panel) addressed both merit review criteria?<br>Comments:<br><br>The COV members recommend a more structured review template in order to ensure consistency in both the ad hoc and panelist reviews. | YES |
| 2. Have the panel summaries addressed both merit review criteria?<br>Comments:<br><br>The panel summary places much of its emphasis on scientific merit. Perhaps a more structured template regarding what should be commented on would help flesh out these summaries. | YES |
| 3. Have the *review analyses* addressed both merit review criteria?<br>Comments: | YES |

[9] In "Not Applicable" please explain why in the "Comments" section.

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| The review analyses were helpful and attended to both review criteria with some balance. | |

4. Additional comments with respect to implementation of NSF's merit review criteria:

If a naïve observer were given just the reviews and had to predict which proposals were funded, the extreme ones could easily be identified, but many applications in the middle range would not be predictable. For example, two proposals that were rated E, G, and F were ultimately funded, but mitigating factors such as developing a new machine or involving a young woman scientist seem to have governed the decision. In another case, the involvement of undergraduate women in the research may have played too heavy a role in a funding decision.

The COV members recommend a possible restructuring of the review template so that reviewers, panelists, and PO's have a shared understanding of the review criteria. For example, in the Broader Impact section, everyone knows that K-12 impact has an effect. It might make more sense to create a checklist for the most common types of impact and give the PI an opportunity to add further items as appropriate.

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| **SELECTION OF REVIEWERS** | **YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[10]** |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br>Comments:<br><br>In the most recent year, the average number of reviewers outside the panel summary has been 5.9. Either an increase in the number of panelists or phone calls to potential ad hoc reviewers might increase the hit rate. Another NSF program has targeted mid-career investigators as possible reviewers with an increase in hit rate. | YES |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br>Comments:<br><br>The COV members recommend that there be less emphasis on methodological innovation as the science matures. It is appropriate to reconsider the make-up of the panel and to encourage a better balance of cognitive scientists, neuroscientists and methodologists. | YES |

[10] If "Not Applicable" please explain why in the "Comments" section.

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|---|---|
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[11]<br>Comments:<br><br>The data are available for reviewer characteristics such as geographical location and affiliation, and there was overall balance between the reviewers on these two parameters. In a few instances, however, there was more than one panelist from the same institution serving on the panel. There are no data available to assess the participation of underrepresented groups in the review process. | No data available |
| 4. Did the program recognize and resolve conflicts of interest when appropriate?<br>Comments:<br><br>There was one explicit case where a reviewer was a former student of the PI, and the reviewer commented explicitly that she had a potential conflict. | No data available |
| 5. Additional comments on reviewer selection:<br><br>It might be helpful to update the reviewer form and add a checkbox to indicate whether the reviewer had a conflict of interest in case the PI or the PO did not recognize a potential conflict. | |

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[12], OR DATA NOT AVAILABLE |
|---|---|
| 1. Overall quality of the research and/or education projects supported by the program.<br>Comments:<br><br>With few exceptions, the quality of the research projects is quite high. There are cases in which it was not clear from the portfolio of reviews why certain projects were funded other than that special circumstances may have existed (e.g., emphasis on training women undergraduates or development of a new technology). Of course, the funding decisions about these projects may have hinged heavily on the Broader Impacts criterion, but COV members urged caution in exercising these criteria in the face of ratings of intellectual merit | appropriate |

[11] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

[12] If "Not Appropriate" please explain why in the "Comments" section.

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| that might not be enthusiastic. | |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br>Comments:<br><br>On the whole, the sizes of budgets for imaging research in cognitive neuroscience were simply too small. The main issue here is statistical power. Funding a project that includes multiple experiments with sample sizes that are too small in each will likely result in an unacceptably high rate of type I and type II statistical errors. The likely response by investigators is to truncate their proposed programs of research in order to bolster the sample sizes of their remaining studies. As long as the Foundation recognizes that this result is likely, there is little harm. However, if they predicate funding on an expectation of a full research agenda being completed, there is danger of disappointment. | inappropriate |
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[13]<br>Comments:<br><br>The COV did not have sufficient information about what constitutes a high-risk project. However, an examination of the criteria for high-risk on the NSF website (e.g, untried and untested, high reward but high probability of failure, contrary to current theory of paradigms, risk to principal investigators) almost mandate that this sort of research will not pass a panel review. The system is not created to meet criteria of this sort. Both because panels of people will be more risk-averse than individuals will be and because the adaptation level of the panel is toward more traditional research grants, high-risk grant proposals are not likely to pass a panel filter. Of course, such proposals cannot be vetted by ad hoc reviewers either, in that they will evaluate such proposals according to stock criteria that they use with more traditional proposals. So, if the Foundation hopes to stimulate more high-risk and innovative research programs, it needs to develop an innovative evaluation mechanism that is not inevitably fatal to such applications. | inappropriate |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br>Comments:<br><br>Most proposals have been reviewed jointly with another panel, as they should be in cognitive neuroscience. This program, after all, is defined by a set of methods applied to the study of cognition and emotion. So, interdisciplinary evaluation of most applications with programs such as PAC that are responsible for substantive areas should be the norm. Another sense in which the program is responsive to multidisciplinary approaches is | yes |

[13] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

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| that many of the funded projects are based on collaborations among scientists with differing expertise. Again, this is the norm in cognitive neuroscience in that expertise in psychology, neuroscience, physics, biostatistics, and engineering are often called into play for any particular project, and this is reflected in many funded projects. | |
| 5. Does the program portfolio have an appropriate balance of:<br>• Funding for centers, groups and awards to individuals?<br>Comments:<br><br>There have been 7 collaborative proposals during this time organized in 3 centers, with others that involve subcontracts. This seems appropriate for a newly developing science that is intensely multidisciplinary. The balance of the awards are to individual investigators, and even these often included collaborations among different disciplines, as reflected in the response to item #4 above. | yes |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators?<br>Comments:<br><br>Although some 70% of awards went to new investigators to NSF, this does not reflect the true number of awards to first-time funded investigators. Only 30% of awards went to investigators who had no funding from any other agency. Thus, if "new investigator" is defined as an investigator with no prior history of funding, just fewer than one-third of all projects were awarded to such PI's. The COV finds this to be an appropriate proportion in that the base rate of scientific progress is likely to be higher among investigators who are seasoned in the science and who have a track record of earlier productivity. | yes |
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br>Comments:<br><br>Among currently awarded grants, 23 are from institutions in the Northeast, 19 from institutions in the West, and 7, 6, and 4 respectively from institutions in the mid-Atlantic, South, and Midwest. This seems an appropriate balance, in that research-intensive institutions are disproportionately located in the Northeast and West. | yes |
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br>Comments:<br><br>The nature of the cognitive neuroscience discipline favors research-intensive institutions because of the large investment needed in equipment and human technical resources. Thus, these institutions dominate the portfolio of funded projects, and this is appropriate given how resources are currently | yes |

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| concentrated in the U.S. As new and less expensive technologies develop (e.g., near-infrared imaging), there will be more opportunity for less well-financed institutions to be in a position to apply for funding from this program. The COV members also encourage NSF to develop specific initiatives that would promote collaborations between research-intensive institutions and less well-financed institutions. This would offer an additional opportunity to foster partnership with predominantly black institutions, in order to improve research infrastructure at these institutions as well as train a pool of minority students in cognitive neuroscience. | |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br>Comments:<br><br>There are 3 RUI grants in the portfolio, as well as three grants to undergraduate-intensive institutions in the sample of 19 funded projects that the COV was given. There was some concern that the quality of the science in the sample of two RUI applications may not have been the equal of the science supported by the remainder of the program. The program needs to be cautious that it applies similar scientific criteria to these applications as to others. There was also some discussion in a cross-disciplinary break-out group about whether REU institutional grants are an effective mechanism in cognitive neuroscience as they may be in other disciplines. The issue is that technical training in cognitive neuroscience requires a substantial investment of time, and a summer research experience may be too limited to realize substantial benefit. This reasoning does not necessarily apply to REU supplements to individual grants, where the training component can encompass both summer and academic year. | yes |
| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities?<br>Comments:<br><br>Topics in attention and perception are the most heavily represented areas, but if this work includes a good balance of vision and other modalities (as opposed to vision predominantly), this would be justified by the scientific developments in these topics. Also, the application of cognitive neuroscientific methods appears to have been most productive at the early end of the processing stream historically. The COV noted that there was little work on cross-modal interaction in the portfolio, and this is becoming a topic of intense scrutiny. Also, there was little supported work using functional or structural connectivity techniques. In that cognitive neuroscience has now advanced to the point of being able to identify networks of brain regions that participate in tasks, it is well worthwhile to support technical and substantive developments using these techniques. | yes |

| | |
|---|---|
| 11. Does the program portfolio have appropriate participation of underrepresented groups?<br>Comments:<br><br>Although there are only 2 funded proposals from underrepresented groups and only 14 from women among 59 total current awards, this does not appear to be a problem of the review mechanism. What needs to be done about this is to increase the supply of underrepresented scientists and women earlier in the pipeline. Institutional support for earlier training (e.g., with historically Black colleges) would be a big help in developing more underrepresented students in the pipeline. | no |
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br>Comments:<br><br>The issue here is one of balance. Using the "tools, people, and ideas" criteria, the program early on was good at developing technical tools. The program now is doing well in fostering young scientists and yet preserving an appropriate balance between young and more established scientists. The major challenge facing the program now is to transition to better development of ideas. This is already reflected in the current portfolio which includes many projects concerned with the study of cognitive and affective processes rather than techniques per se. Although there will continue to be a need to develop the techniques of cognitive neuroscience, at this point the bulk of the funding in this program should be devoted to substantive topics that use these techniques productively. The program announcement may need revision to reflect an increased emphasis on substantive studies rather than the emphasis on innovation in technical development that may have been present early in the program's history. | yes |
| 13. Additional comments on the quality of the projects or the balance of the portfolio:<br><br>While still quite young, the field of cognitive neuroscience is maturing at a rapid rate. Already, the title "cognitive neuroscience" does not properly recognize that this field includes the study of cognitive, affective, social, and other psychological processes. Also, the proliferation of imaging and stimulation techniques has been quite remarkable in recent years. The Program seems to be keeping up with these rapid changes, as reflected in its funding profile. It needs to stay attuned to the rapidly changing landscape of techniques (e.g., TMS, near-IR) and to the rapidly changing landscape of ideas and topic areas. These will not ossify anytime soon, and so the program needs to remain flexible in what it considers appropriate topics for study for many years to come. | |

**A.5 Management of the program under review**. Please comment on:

1. Management of the program.
Comments:

The current PO has done a marvelous job of transitioning into his role under difficult circumstances. He entered the program in October, 2005 and succeeded in having a panel meeting by December, 2005. Furthermore, there was very little overlap between him and his predecessor. Although there are mechanisms in place to train new PO's, having as many rotators as this program has had limits the amount of memory that the program has. Add to this that there is substantial rotation among panel members, and this problem is exacerbated. Some thought should be given to establishing more programmatic memory in the PO and in the panel so that there is more continuity of funding priorities, ideas, and perspective.

2. Responsiveness of the program to emerging research and education opportunities.
Comments:

The program is very much investigator-initiated. It is opportunistic in taking advantage of what happens to come in the door. There is less top-down guidance in decisions about what issues deserve priority. Perhaps the review panel needs to take on the task of discussing what new issues and hot topics are ripe for investment. They could do this either in a short session after reviewing applications or by conference call at another time. If this suggestion is taken, it has implications for the constitution of the panel: It will need a substantial representation of established scientists who have long-term perspective on the field.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.
Comments:

This is essentially the same issue as discussed in response to #2. In addition to the review panel serving as a source of information about future trends, perhaps at a national conference (e.g., Cognitive Neuroscience Society or the Society for Neuroscience), the PO could convene a group of investigators who might deliberate about future trends. If the PO organized such a group for a lunch session, he/she might be able to enlist the participation of senior scientists who might not otherwise participate on panels, but who could be a valuable source of information about future trends, funding priorities, planning for new developments in the field, and ideas about the development of young investigators.

4. Additional comments on program management:

Additional support staff to work with the Program Officer would be a help, especially given the number of commitments that he has beyond administration of the program and given that a part of his time remains as a scientist at his home institution. It is difficult for any Program Officer to be forward-thinking about new developments if he/she devotes too much time to clerical and administrative work that could be done by an assistant.

## PART B. RESULTS OF NSF INVESTMENTS

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

### B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

**B.1 <u>OUTCOME GOAL for PEOPLE</u>: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

Comments:

The areas of research covered by CNI are notoriously difficult specializations in which to recruit under-represented scientists. The creation of a diverse workforce in this area is obviously a problem that the PO cannot solve; that must be the responsibility of forces that operate earlier in the pipeline. Given these constraints, the PO appears to be making appropriate efforts to be inclusive with respect to representations on panels, ad hoc reviewers, and recipients of funding.
At a more general level, NSF should consider further mechanisms to foster the development of minority and women in the cognitive neuroscience area. For example, when proposals for symposia, summer institutes or mentoring programs are funded, NSF might consider offering the PI

additional funding that would be targeted particularly for under-represented groups. The goal is to aid in developing a pool of scientists who will then be trained appropriately to make submissions to this program. If, in contrast, the only means of ensuring representation by these groups is to change the threshold for funding, it could ultimately undermine their welfare by creating a negative correlation between minority status and research quality. Thus, it is very important to guard the quality of the science while at the same time taking steps to add underrepresented groups to the pipeline early in their careers.

**B.2 OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."**

Comments:

As was mentioned previously, the COV perceives a gradual shift in the thrust of the CNI from developing tools to developing ideas. The substantive topics it is covering are on the cutting edge of cognitive neuroscience, but they increasingly rely on already well-developed methodologies. A number of important findings from CNI-funded researchers are apparent in the review of cognitive neuroscience nuggets, which point to progress in identifying brain mechanisms underlying basic memory processes, executive control and multi-tasking, speech perception and production, and attentional focus.

**B.3 OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

The proportion of tool innovation to substantive findings in the program's portfolio is shifting, and appropriately so, as the curve in tool development is flattening in comparison to the early years of the program. There are still fields to plow here, but they are selective, and they should be taken as priorities in the context of substantive problems that need to be solved. One landmark of tool-development in CNI's recent funding record is the work on perfusion MRI, a more direct and quantitative measure of cerebral blood flow than conventional BOLD fMRI. This promising technique will no doubt lead to further methodological innovation, in which CNI will play a facilitative role.

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[14]**

Comments:

NSF's goals of agility and innovation are particularly important for the rapidly developing area of cognitive neuroscience. However, we feel that the current rotator system is working against these goals. We recognize that the idea behind the rotator model is that getting a constant influx of new blood is bound to foster innovation and new ideas. In practice, however, any such advantage is far overshadowed by the disadvantages attendant to constant turnover. As a new PO comes in the door, there is not only minimal overlap with the predecessor, but also formal prohibitions against extended exchange between the two after the former PO leaves government employment. The newcomer is never ahead of the curve but instead is constantly catching up. A year or so later, the

[14] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

PO must make plans to leave, and the process starts again. This is an anomalous business model that stunts the ability of the program to act proactively. Time is needed for the PO to absorb the NSF culture and to connect to a scientific community who can help define CNI's programmatic agenda and forecast trends. Multiple cycles will be necessary for the PO to evaluate the outcomes of investment; simply reading a previous COV report can never have this effect. We strongly recommend that a PO be appointed for the CNI for a time that allows him or her to function effectively in these roles; we envision a term of at least several years. We doubt that there will be any cost in terms of lost motivation or new ideas, as the rotator model assumes; in fact, a longer tenure as PO is likely to lead to a substantial benefit by these criteria.

## PART C. OTHER TOPICS

### C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

The NIH Roadmap initiative has changed the balance of funding for basic research. As the picture becomes clear as to what basic science NIH will not fund, opportunities for NSF are emerging. An example is genomic and proteinonomic studies of individual differences in cognition and affect. Although the genetics of cognition and affect are complex due to inevitable polymorphisms, there are beginning to be discoveries about the genetics of neurotransmitter control. This is a ripe area for basic research that is unconnected to disease models. Another example is structural and functional connectivity studies that attempt to show how brain regions are linked during cognitive processes. While the beginning of cognitive neuroscience was heavily characterized by identification of individual regions of activation associated with individual tasks, the next wave of discoveries will have to with the connectivity and timing relations among these regions. Significant support for imaging and statistical techniques will be needed to allow this area to mature.

### C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

### C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

It is generally acknowledged that reviewers do not understand how to define and evaluate the "broader impacts" of proposed research. As a result, impact is not particularly useful as a criterion for the funding decision. A related problem is that there is no follow-up evaluation of impact at the individual-proposal level, either during the period of research funding or after it. Even the COV is given only rough guidelines for programmatic impact, to be assessed across the entire portfolio of funded research. If impact is to be a serious criterion for NSF funding, further mechanisms are needed to

solve these problems. Reviewers (and for that matter, PIs) should be given more specific impact criteria, such as K-12 education, translation from research into development, or minority training. They should be asked to report on impact criteria in specific ways (e.g., "3 women in lab" could mean doing real research but might mean simply Xeroxing papers). NSF should consider making a serious evaluation of impact part of its process.

An examination of previous reviews clearly indicates that ad hoc reviewers are not being used effectively. They are difficult to recruit, typically with only 35% return, resulting in wasted time and expense. The reviewing process itself offers no opportunity for dialogue and mutual shaping of opinion or scoring criteria. The result is a set of reviews that are often in disagreement and appear to be largely ignored by panel members. We suggest that NSF should re-consider how it uses ad hocs. Several modifications should be considered. (1) Use ad hocs only when special expertise is required that is not covered by the standing panel. (2) Re-consider the relationship between panel size and ad hoc reviewer number. Appoint more panelists to cover the field more fully and reduce the number of ad hocs that are needed. (3) Treat ad hocs more like panel members, as NIH does telephone reviewers. This means that they should have preliminary access to other reviews, and if possible, they should phone in so as to have a dialogue with panelists when the proposal's fate is decided.

A number of practices at NSF tend to reduce its institutional memory, in particular, the use of rotators and the frequently rapid turnover over of panel members. As was described above, we see advantages for a longer term of PO at CNI than can be accommodated by the rotator model. But more generally, NSF should reconsider the ratio of rotators to permanent positions. Money saved on rotators might be money squandered by re-inventing the wheel in the absence of institutional memory.

A problem related to lack of institutional memory is that there is no real way for PIs to "revise and resubmit" to NSF. No additional space is allowed for the PI to explain how a rejected proposal was changed in resubmission. Indeed, given panel and PO turnover, no one may recognize it as a resubmission. Also, the same proposal can be resubmitted several times with no penalty. Attention should be given to how to create a realistic channel for a PI to improve a proposal in response to negative review and have the changes appreciated.

The history of the CNI provides an excellent lesson in how **not** to fund a new program. The first round of funded proposals effectively committed the budget for years to come, so that the second PO to head the CNI was forced to give small, ineffective amounts and ask promising investigators to re-propose for more. We suggest that when starting a program, NSF should step into the budget rather than giving the whole budget at once, or it should designate a portion of each of the initial years' funding to go to short-term projects that will not tie the hands of the next program manager. The same issue applies to the infusion of new money into the program's budget, such as that expected in the coming years. This should be staged in sensibly so that it is not all committed early on.

### C.4 Please provide comments on any other issues the COV feels are relevant.

There are still comments from the previous COV report that were not addressed between then and now. Perhaps better follow-through from the report is needed.

With an anticipated 8% increase in the budget each year for the next decade, this is an excellent time for the program to be forward looking in predicting what new funding opportunities may be in the offing. Examples are provided above, and we urge that the PO use his panel and consultation with outside experts (as discussed above, this might be accomplished at a national meting) to come up with an agenda of high funding priorities.

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

Perhaps it would be wise to distribute to the COV report template at the earliest opportunity, even before COV members are given access to the eJacket website. That way, committee members can get a quick sense of the major agenda items that NSF has in mind, and so they can search the site and review the Jackets with those agenda items in mind. Also, agenda items that came up at the meeting that were cross-disciplinary might have been given some more preview so that COV members could come to the meeting with some ideas in mind rather than developing all these ideas at the meeting itself.

**SIGNATURE BLOCK:**

Emmeline Edwards
John Jonides
Roberta Klatzky

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For the 2006 BCS COV

# Cultural Anthropology

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| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: CULTURAL ANTHROPOLOGY** |
| **Division: BCS** |
| **Directorate: SBE** |

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

### A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[15] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br>Comments:<br><br>We recommend more diversity in the selection of panelists (a practice begun by the current Program Officer). When the number of dissertation grant proposals exceeds 18 proposals per reviewer, we recommend that an additional panel (or panels) be constituted. The practice of soliciting ad hoc reviews for dissertation proposals should be dropped (in favor of panel review), given the difficulty in eliciting enough responses to contribute significantly to the review process and the prospect of diminishing the willingness of reviewers to provide reviews for senior scholars' proposals. If the number of dissertation research proposals increases substantially, we recommend an additional Program Officer. | Yes |
| 2. Is the review process efficient and effective?<br>Comments:<br><br>On efficiency:<br>The ad hoc reviews for dissertation proposals perhaps need to be dropped. (See our response to the last question for our rationale.) We recommend that | No |

[15] If "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| all reviewers be given four weeks to return ad hoc reviews, with a possible grace period up to the discretion of the staffperson monitoring responses (which may be the Program Officer or an additional staffperson).<br><br>On effectiveness:<br>The Program is completing responses effectively, despite the challenges of understaffing. | |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?<br>Comments:<br><br>We suggest that the evaluation criteria given to reviewers be modified through the addition of a third question (to appear between the two current questions): "How would you assess the appropriateness of the research design to the research question?" | No |
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br>Comments:<br><br>We encourage a note from the Program Officer appended to the Panel Summary for the PI in cases where the Review Analysis and outcome differ greatly from the Panel Summary (to reduce confusion for the PI). This would explain how the reviewers' comments were weighted in the final decision. | No (not always). |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br>Comments:<br><br>The addition of review analyses has been very important to this process. | Yes. |
| 6. Is the time to decision appropriate?<br>Comments:<br>T<br>he mean of 6 months between application and decision is reasonable. | Yes. |
| 7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:<br><br>We would like to reiterate the importance of diversification in the selection of reviewers and attention to the fit between the research question and the research design in evaluation of proposals, which would together help to address any problems we have noted in the use of procedures. | |

**A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.** Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[16] |
|---|---|
| 1. Have the individual reviews (either mail or panel) addressed both merit review criteria?<br>Comments:<br><br>The reviews have often addressed both questions, but in answering the first question, reviewers have often discussed methodology more than the contributions of proposed research to broader conversations in cultural anthropology. | Yes. |
| 2. Have the panel summaries addressed both merit review criteria?<br>Comments:<br><br>The panels have tended to weight the proposal merit over the broader impact in discussions of proposals. | Yes. |
| 3. Have the *review analyses* (Form 7s) addressed both merit review criteria?<br>Comments:<br><br>Intellectual merit has often been collapsed with a discussion of methodology by the Program Officer in discussing the first criterion. We will reiterate here that it would be useful for the Cultural Anthropology program to add a third question for reviewers about the link between the research question and the research design. | Yes. |
| 4. Additional comments with respect to implementation of NSF's merit review criteria:<br><br>There is very uneven use of the letters assigned to the proposals, which is a serious problem given the way that these rankings inform the Program Officers in ranking proposals. More instruction should be given to the reviewers regarding the use of E,V,G,and F. | |

[16] In "Not Applicable" please explain why in the "Comments" section.

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| SELECTION OF REVIEWERS | YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[17] |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br>Comments:<br><br>We noticed that at the beginning of the current COV review period there was not enough diversity in reviewers, but toward the end of the period more reviewers were being recruited. | No. |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br>Comments:<br><br>We recommend that greater care and attention go into selecting a broader range in topical, theoretical, and methodological expertise among the reviewers. | Yes. |
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[18]<br>Comments:<br><br>We feel that reviewers represented the nation well geographically and institutionally, but not by underrepresented groups. Topical diversity is needed as well. | No. |
| 4. Did the program recognize and resolve conflicts of interest when appropriate?<br>Comments:<br><br>The program does an excellent job of informing reviewers about conflict of interest and providing a mechanism for addressing conflicts of interest if they arise during the review process. | Yes. |
| 5. Additional comments on reviewer selection:<br><br>We stress the importance of diversity in the selection of reviewers. | |

[17] If "Not Applicable" please explain why in the "Comments" section.

[18] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[19], OR DATA NOT AVAILABLE |
|---|---|
| 1. Overall quality of the research and/or education projects supported by the program.<br>Comments:<br><br>The funded proposals are excellent. We question whether there were projects also of high value that were not funded because the judgment of scientific merit may have been more narrow than we would recommend. | Yes. |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br>Comments:<br><br>We find no problems with the size and duration of senior awards, or the duration of graduate awards. We would like to recommend adamantly that the size of graduate awards be increased to $16,000, if possible, and that travel and ancillary expenses be separated from the base stipend. | No. |
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[20]<br>Comments:<br><br>The review process seems to have inhibited high-risk proposals and innovation in research design. | No. |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br>Comments:<br><br>Multidisciplinary approaches are evident in a number of proposals, as one would expect in an interdisciplinary discipline. Data are not available for evaluating the number of cross-disciplinary projects. We find this question to be unclear. | Data not available |

[19] If "Not Appropriate" please explain why in the "Comments" section.

[20] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

| | |
|---|---|
| 5. Does the program portfolio have an appropriate balance of:<br>• Funding for centers, groups and awards to individuals?<br>Comments:<br><br>Yes, there is a good balance between funding given to centers, groups, and individuals. We suggest keeping the ratio of funding going into methodological training, for now, but that qualitative and quantitative methods always be covered in that training and that there be more assessment of outcomes related to that training. We suggest linking grants for methods training to participants' giving methodological workshops in their own institutions as a way of disseminating what they have learned. | Yes |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators?<br>Comments:<br><br>The awards to new investigators average over a third of the program's budget, which seems a generous percentage dedicated to support new PIs. | Yes. |
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br>Comments:<br><br>The geographical distribution of Principal Investigators appears to be well-balanced, by region. | Yes. |
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br>Comments:<br><br>We feel that there is an appropriate balance of institutions among the funded proposals. | Yes. |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br>Comments:<br><br>At least 25% of the budget of the Cultural Anthropology program is devoted to methods training, which fundamentally integrates education and research. A large percentage of the budget is devoted to graduate student support through dissertation research and research assistance on senior researchers' projects, which also integrates research and education. Undergraduates are also involved in research through supplemental awards. We assert that this program is extremely devoted to integrating research and education. The means of meeting this goal need to be reevaluated with a frequency of more than three years. | Yes. |

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| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities?<br>Comments:<br><br>We cannot evaluate, based on the portfolio we have seen, the balance across disciplines and subdisciplines, but we would like to comment on the area of emerging opportunities. There is underrepresentation of many important topics in cultural anthropological research, especially emergent areas of concern including globalization, transnationalism, environmental justice, identities, nationalism and citizenship, gender and sexuality, science studies, and others. | No. |
| 11. Does the program portfolio have appropriate participation of underrepresented groups?<br>Comments:<br><br>It is clear to us that there need to be active efforts to recruit proposals much more widely in cultural anthropology, perhaps by the Program Officer visiting a number of smaller professional meetings. Members of underrepresented groups need to be encouraged actively to consider NSF as a funding source for cultural anthropology research projects. Better representation of underrepresented groups on review panels and broadening the topics reviewed positively will help ameliorate this problem. | No. |
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br>Comments:<br><br>Cultural anthropological research funded by NSF provides vital information to the U.S. citizenry on cross-cultural understanding, cultural and social dimensions of environmental change, migration and refugee issues, economic and social globalization, religious and political variation, issues of development and modernity, natural resource valorization and planning, cultural and environmental impacts of disasters, and other topics of intense national concern. | Yes. |
| 13. Additional comments on the quality of the projects or the balance of the portfolio:<br><br>We recommend both maintaining the high quality of cultural anthropological research funded through this NSF program and increasing the topical diversity of awards. | |

**A.5 Management of the program under review**. Please comment on:

1. Management of the program.
Comments:

We find the current management of the program excellent, especially in the face of staffing challenges.

2. Responsiveness of the program to emerging research and education opportunities.
Comments:

Increased staffing of the program, e.g., a program assistant dedicated solely to this program, would enable the Program Officer to do vital additional outreach, especially to underrepresented areas and groups. A postdoctoral program would be a way to meet the needs of emerging and diverse scholars and build the future of cultural anthropology in this nation.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.
Comments:

The cultural anthropology program devotes 25% of its budget to training and education in research methods; this reflects a long-term strategy to invest in the development of scientifically focused young scholars who might, in the future, submit excellent proposals. We support this type of long-term thinking about mentoring and interconnected levels of professional development. We would like to reiterate our support of the high rate of funding for new PIs and our recommendations for increased financial awards for dissertation improvement. In reference to the second part of this question, we would like to reiterate that the prioritization of proposal funding has, in the past, narrowed some topical representation, but we feel that this is being addressed currently.

4. Additional comments on program management:

We recommend strongly that there be additional staffing provided to this program. It is critical to maintaining and expanding the quality of the program.

## PART B. RESULTS OF NSF INVESTMENTS

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

## B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

**B.1 <u>OUTCOME GOAL for PEOPLE</u>: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

Comments:

A number of the funded proposals include initiatives for cooperative research with other nations. award # 0453242 to Stevan Harrell, University of Washington, for example, states: "This project will strengthen ties leading to further international cooperation in research on migration and family structure." Our national scientific workforce is strengthened through engagement of international scholars and issues. Cultural anthropology is a subfield of an interdisciplinary discipline, and as such, encourages multidisciplinary research (e.g., NSF award 0352670, Lee Cronk, Rutgers University, New Brunswick). This breadth enhances a diverse and competitive scientific workforce. Our citizens are better prepared for debates about national security, hazards management, and natural disasters through the research of cultural anthropologists as well. Examples of recent investments in research related to these topics include award # 0446738 to Scott Atran, University of Michigan; award # 0214406 (Collaborative Research: Perceptions of Risk from Nuclear Testing in Kazakhstan: A Comparative Study of Kazakh Villagers, Health Care Workers, and Research Scientists) to Cynthia Werner, Texas A & M Research Foundation; and award # 0555146 to Katherine Browne, Colorado State University, "Katrina Loss and Survival."

**B.2 <u>OUTCOME GOAL for IDEAS</u>: Enabling "discovery across the frontier of science and**

**engineering, connected to learning, innovation, and service to society."**

Comments:

Cultural anthropology projects funded through this program have demonstrated technological innovation. One example is award #0352670 to Lee Cronk, Rutgers University, New Brunswick, "Using Motion Capture Animation Technology to Record Movement in the Field." As the proposal states, "This exploratory research project demonstrated that motion capture technology has great potential for use in both laboratory and field settings." Cultural anthropological research involves innovative ideas, as in the investigation of fertility, industrialization, and migration by David Kertzer, Brown University, award # 0418443, "Explaining Very Low Fertility." Recently funded projects have focused on issues of vital concern to all residents of society, e.g., knowledge and use of resources as in the project "Ecological Knowledge and Success in a Puerto Rican Small-scale Fishery" funded through award # 0314211 to Ervan Garrison, University of Georgia. We encourage research that serves the interests of all members of society, and innovations in collaborative methodologies and theoretical approaches.

**B.3 OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

Comments:

Cultural anthropologists have been involved in innovative projects to develop multidisciplinary infrastructure for research, which can inform national projects in research and education. For example, "Culture and Individual Adaptation to Stress," award # 0091903 to William Dressler of the University of Alabama, Tuscaloosa, reports that it "serves as a model for carrying out interdisciplinary work" at the intersection of cultural anthropology and biology. Another example of anthropological research providing broadly accessible infrastructure is research on the issue of marginality and subsistence involving collaborative research on the Pine Ridge Indian Reservation (award # 0092527 to Kathleen Pickering, Colorado State University).

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[21]**

Comments:
The NSF Cultural Anthropology Program is making innovative use of its resources through heavy investment in future scientists by allocating a large percentage of its budget to training undergraduate and graduate students and projects by new PIs. This strategy leads to a compound investment in research excellence. One example is "Collaborative Research: Socioeconomic and Kinship Factors in Infant and Child Mortality in Historical Slovonia," an award for collaborative research to Aaron Gullickson (Columbia University, award # 0514291) and Eugene Hammel (University of California, Berkeley, award # 0514465). Gullickson is a new PI and Hammel is a senior researcher. The program, in many ways, encourages such collaboration between scholarly generations.

# PART C. OTHER TOPICS

[21] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

**C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.**

We encourage taking advantage of any mechanisms available for advancing and monitoring broadened participation in NSF-funded cultural anthropological research. Toward this end, we suggest the following: (1) creating clearer instructions for those preparing and reviewing proposals regarding diversity initiatives and incentives to participate in those; (2) reinstituting new PI initiatives and perhaps initiating a postdoctoral minority fellowship program in cultural anthropology; and (3) actively recruiting more diverse panels and instructing them that underrepresented groups and topics are important considerations in the program. We also suggest more direct links between programs – e.g., cultural anthropology and physical anthropology – and links with American Anthropological Association materials on topics of great concern in the discipline, as in anthropological contributions to discussions of race in society. We encourage investment in interdisciplinary and multidisciplinary conferences on such topics. We reiterate the need to add a third question to the criteria for submitting and assessing proposals that has to do with the fit between the research question and design.

**C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.**

We strongly recommend that the program's stated goals be revised on the website for the Cultural Anthropology Program. On the website, it needs to be stated that anthropology is an interdisciplinary discipline, and as such it has many connections to other divisions within the NSF. We suggest some new areas of research as examples of what might be included in this revision of the website in our responses to A.4.10 and A.4.12. Aspects of cultural anthropology could be better featured on the website, e.g., intradisciplinary, interdisciplinary, and community-academic partnerships, as well as attention to the cultural implications of new communicative technologies, for example. At the dissertation level, particularly, we feel that the program is funding a good mix of high-risk and other proposals.

We recommend that the Program Officer reject project reports in which the PIs do not address all of the questions in sufficient depth. We emphasize that these reports provide the basis for monitoring accountability to program goals and sufficient information on community outreach, incorporation of science education, and findings is vital to the program.

**C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.**

NSF needs to provide more information to reviewers generally, e.g., a tutorial on proposal-writing online and excellent examples of (a) fit between question and research design, (b) social impact, and (c) incorporation of underrepresented groups in long-term research programs. We also recommend (1) that the REUs be extended to six months to one year to better facilitate the training of students in anthropological science and to enhance their independent research experience, (2) that the young scholar PI initiative

be reinstated, and (3) that there be more communication and programs between divisions and perhaps even cross-division panels to better evaluate multidisciplinary proposals.

If the NSF budget increases, we feel that a priority area for increasing funding across the agency is to meet staffing needs. Staff shortages are evident, and while current staff members are coping well, many vital new initiatives cannot be undertaken without additional staffing in each program.

NSF-wide attention to science education should be less concentrated in a few centers and distributed more widely across programs and across regions of the nation. We urge attention to early science education, particularly in funding a more diverse public face of science through, for example, children's television programs.

**C.4 Please provide comments on any other issues the COV feels are relevant.**

We want to recognize the cultural anthropology program for a good recent mix of funded initiatives, and recommend that future attention be paid to further increasing the range of topics and scholars represented in the portfolio.

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

The COV participants need to be provided with clearer instructions for navigating proposal materials in ejacket (e.g., explanations of what the categories on the drop-down menu mean and include). Some of the questions on the template are worded ambiguously. We appreciated the specific questions from the program officer in the cultural anthropology program.

**SIGNATURE BLOCK:**
Benjamin Blount
Leo Chavez
Ann Kingsolver

_____
For the 2006 BCS COV

# Developmental & Learning Sciences

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|---|
| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: DEVELOPMENTAL & LEARNING SCIENCES** |
| **Division: BCS** |
| **Directorate: SBE** |

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

**A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.** Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[22] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br>Comments:<br><br>Yes. The NSF's review process is the gold standard of scientific review. Site visits are used sparingly but appropriately. Peer review is key to ensuring scientific quality which in turn creates knowledge, skills, technology etc. that feed into the national and global economy. | Yes |
| 2. Is the review process efficient and effective?<br>Comments:<br><br>In general, yes. Our concern – a continuing one of COVs – is with the number of ad hoc reviews returned. Alternative mechanisms should be explored to address this problem. The identification of expert reviewers is appropriate. However, we believe there are concerns about the way in which reviews are solicited and the low numbers that are returned. One problem may be that there is a perception that because so many requests are sent, that any one potential reviewer may feel his or her contribution is not crucial. It would be important to convey to potential reviewers that they are perceived as THE expert for this | Yes and No |

[22] If "Not Applicable" please explain why in the "Comments" section.

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| particular proposal and one of a small number of people being asked. Perhaps if reviewers were solicited more along the lines they are for journals (fewer in number and sequentially) that they would perceive their role as more critical. | |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?<br>Comments:<br><br>Yes. Although short, the reviews are highly informative and specific. | Yes |
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br>Comments:<br><br>Yes. The Program Officers have been excellent and knowledgeable about the research topics, which is essential for understanding and summarizing panel reviews and discussion. This is crucial. It has been possible only with Program Officers who themselves have had a strong research background. | Yes |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br>Comments:<br><br>Yes. They seem excellent. | Yes |
| 6. Is the time to decision appropriate?<br>Comments:<br><br>In general, yes. We are concerned, however, about the high percentage of proposals in 2003 and 2005 that we over 9 months (24% and 18%, respectively). We presume that this reflects transitions in staff, but is something that should be watched. | Yes and NO |
| 7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:<br><br>We are concerned that any given panelist not be assigned too large a number of proposals to review. When panelists get too many proposals (e.g., more than a dozen), the quality of their reviews and ability to respond to other panelists' questions necessarily deteriorates. If necessary for workload, panels may need to add members. However, we are concerned, too, that panels not become too large or the quality of the discussion deteriorates. If the demands on a given panel seem to increase unduly so that individual panelists are being assigned too | |

many proposals to review, a better solution would be to create a new specialty panel (or divide into sub-panels) to serve all needs. We suspect that the workload may also contribute to the high turnover in panelists.

**A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.** Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| **IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA** | **YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE** [23] |
|---|---|
| 1. Have the individual reviews (either mail or panel) addressed both merit review criteria?<br>Comments:<br><br>In general, yes, although the extent to which they are addressed varies across reviewers. | Yes |
| 2. Have the panel summaries addressed both merit review criteria?<br>Comments:<br><br>The panel summaries routinely address both merit criteria. | Yes |
| 3. Have the *review analyses* (Form 7s) addressed both merit review criteria?<br>Comments:<br><br>The review analyses routinely address both merit criteria. | Yes |
| 4. Additional comments with respect to implementation of NSF's merit review criteria:<br><br>We think that more clarification and reconsideration of the implementation of NSF's merit review criteria are needed. We need to expand the notion of broader impact. The worth to society of a research project is not only the immediate application of a finding or the training of a student. | |

[23] In "Not Applicable" please explain why in the "Comments" section.

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| SELECTION OF REVIEWERS | YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[24] |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br>Comments:<br><br>As explained earlier, some proposals received too few reviews. Please see earlier comment about suggestions for increasing responses from ad hoc reviewers in A1.2 | Yes |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br>Comments:<br><br>Generally reviewers seemed to have appropriate expertise and experience. The Program Officer may consider reducing the number of ad hoc reviews solicited for proposals if appropriate expertise is represented in the panel members. | Yes |
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[25]<br>Comments:<br><br>The data are insufficient to evaluate characteristics of reviewers. We would recommend that when reviewers respond to the request to review a proposal, that they be asked to provide basic demographic information about themselves and their institution, explaining that NSF is concerned with various kinds of diversity, and that this information is helpful in trying to make advances in this domain. A simple check list could allow reviewers to enter this information whether or not they agree to review. Obviously it would need to be optional. Some journals already do this, and obtain reasonably good data.<br><br>Some data were available regarding geographical distribution. Below is the number of reviews received from scholars from the different regions of the country. Of note is the significant number of reviews about which geographical | Cannot evaluate: Need more data |

[24] If "Not Applicable" please explain why in the "Comments" section.

[25] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

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| region is unknown. We were surprised to see no report of international reviewers.<br><br>West – 216 East - 425<br>Midwest – 236 Unknown - 101<br>South - 186 | |
| 4. Did the program recognize and resolve conflicts of interest when appropriate?<br>Comments:<br><br>Yes, although the cost of asking people to provide data, examine it, monitor it, etc. is huge and one must wonder about the cost/benefit ratio compared to simply asking people to report COIs (e.g., COIs with respect to ideological as well as only financial, relational, or institutional connections). | Yes, BUT…. |
| 5. Additional comments on reviewer selection:<br><br>In the press to meet other concerns about reviewer distribution, it is critical that scientific expertise remain paramount in selecting reviewers. | |

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[26], OR DATA NOT AVAILABLE |
|---|---|
| 1. Overall quality of the research and/or education projects supported by the program.<br>Comments:<br><br>Excellent. | Yes |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br>Comments:<br><br>No, they are typically under funded and truncate projects prematurely. Longitudinal work is especially important in the developmental and learning sciences. The limited funds preclude appropriate support. This is in addition to the more general problem that affects all substantive areas as a result of in appropriately short grant durations. This adds unnecessary transitional costs, | Yes |

[26] If "Not Appropriate" please explain why in the "Comments" section.

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| e.g., staff termination and rehiring. | |
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[27]<br>Comments:<br><br>Only 2 SGER proposals were funded during the 3-year period. Overall, there is too little money for the DLS program thus making an "appropriate" balance impossible. The program should support solid incremental research as well as innovative, high-risk projects. Thus, although there is currently relatively little financial support for innovative high-risk projects, it is should be pursued in the forthcoming funding climate.<br><br>**Recommendation:** We recommend that a significant portion of the expected new resources be earmarked for innovative, high-risk projects. | Yes and No |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br>Comments:<br><br>This is an aspect of the process for which routine additional data would be helpful. It would be important to have records on submissions that are reviewed by more than one panel and that are funded by more than one panel. However, the information we have now received from the Program Officer shows that DLS is a leader in partnerships across NSF panels. Only 2 of the currently funded DLS grants are entirely supported by DLS funds. | Yes |
| 5. Does the program portfolio have an appropriate balance of:<br>• Funding for centers, groups and awards to individuals?<br>Comments:<br><br>Most of the awards are to individuals and given the amount of funds available this seems appropriate. Unfortunately, DLS has limited funding for conferences and workshops, and as a result misses out on important growth opportunities for scientists. | Yes |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators?<br>Comments:<br><br>The term "new investigator" was unclear to us. Does it mean "new to NSF" or "recent Ph.D."? | Yes |

[27] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

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| New investigators are represented, and funding rates are approximately equal (15% for new investigators and 13% for senior investigators). Across the 3 years, 53%, 84%, and 70% of the awards went to new investigators. Ideally, the awards should be balanced among new, midcareer, and senior investigators.<br>**Recommendation:** The high proportion of grants going to new investigators leads us to recommend a careful analysis of who is being attracted to NSF, the nature of the applicant pool, the substantive foci of new and senior investigators, etc. | |
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br>Comments:<br><br>We analyzed the submission and funding decisions from the random selection of proposals made available to the COV in terms of geographic distribution (this information was not provided in the DLS report). We found the following number of proposals by geographic region. From these data, it appears that the institutions in the west are underrepresented, and institutions in the south have a higher acceptance rate.<br><br>Funded Proposals:<br>West – 1<br>Midwest - 6<br>East - 6<br>South - 7<br><br>Declined:<br>West – 7<br>Midwest – 14<br>East – 18<br>South - 5<br>Puerto Rico - 1<br><br>During our review, the Program Officer provided us with a listing of all funded proposals by state over the past 3 years:<br><br>West – 7<br>Midwest – 20<br>East – 18<br>South - 9 | No |
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br>Comments:<br><br>Based on submission rates the balance of awards across institution types is appropriate; however, it would be useful to explore ways to encourage quality submissions from scientists at 2- and 4-year colleges. | Yes |

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| | |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br>Comments:<br><br>Most sampled had undergraduate participation. There is a real need for graduate student support and the constraints on budgets lead some PIs to hire BA-level staff rather than support graduate students. | Yes and No |
| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities?<br>Comments:<br><br>An impressive array of topics was funded: The impact of TV on young children to adoptive families to infant perception to children's reading and geometric skills. The breakdown by general subdiscipline shows a good representation across subdisciplines and age groups in terms of submissions and awards. | Yes |
| 11. Does the program portfolio have appropriate participation of underrepresented groups?<br>Comments:<br><br>It was difficult to tell because of the lack of identifying information of the PI and the groups being studied. The gender trend is troubling: Percentage of proposals with female PIs that were funded declined across the three years (according to Table 12):<br><br>2003 – 13.3%<br>2004 – 12.1%<br>2005 – 0% (Having seen at least one funded proposal from a women, we believe there data provided need to be checked.) | Hard to say |
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br>Comments:<br><br>Research supported by DLS is fundamental to solving problems in law (e.g., interviewing child victims of crime), education (e.g., understanding basic principles of learning language and other academic skills), public health (e.g., high-risk decision making in youth), and other aspects of normal development that are prerequisite to optimizing developmental outcomes and | Yes |

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| minimizing abnormal development. DLS provides foundational research for complementary applied research focused on issues that are at the heart of the nation's economy, such as workforce development. DLS research is judged to be highly relevant to BCS and NSF's core missions. | |

13. Additional comments on the quality of the projects or the balance of the portfolio:

In contrast to the comments made in the prior COV review, we judge that adolescence is appropriately represented.

**A.5 Management of the program under review**. Please comment on:

1. Management of the program.
Comments:

During the review period, there have been three program officers. The program officers have been extremely well qualified, and have developed an impressive portfolio of proposals. At the same time, the rate of turnover of staff has created problems. Lack of overlap, for example, has created problems of continuity.
**Recommendation:** Ideally there should be two program officers with one permanent staff member and one rotator. A less ideal alternative is two staggered rotators.

2. Responsiveness of the program to emerging research and education opportunities.
Comments:

The program officer and Division Director seem well connected with broader initiatives and to be able to integrate DLS with other initiatives and panels to the reciprocal enhancement of each.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.
Comments:

Limited planning has been conducted over the prior period, but the time is ripe for such planning given emerging trends and projected increases in funding. Some strategic plan should be made concerning the distribution of innovative/high-risk awards, workshops/conferences, and other under-funded priorities. The scientific community perceives that social and behavioral science is highly under-funded relative to other areas of science, and planning and prioritization should address this issue.

4. Additional comments on program management:

An analysis should be conducted to address the issue of some permanent staffing for DLS. Lack of permanent staff may contribute to the pattern of under-funding because staff do not having a sufficient opportunity to understand fully the Foundation and the political context in which it functions.

## PART B. RESULTS OF NSF INVESTMENTS

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

**B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.**

**B.1 <u>OUTCOME GOAL for PEOPLE</u>: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

Comments:

DLS initiatives are directly relevant to this outcome because researchers in this area study the development of children who should become part of "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens," provided that the developmental process is successful. Students are routinely involved in research funded by DLS. Student participation in research is important whether or not the student goes on in science but it promotes a positive regard and understanding of science, crucial for public support for science.

Illustrations can be found in the following:

Award #236723 (PI. Walczyk) – good training opportunities for students, including minority students.

Research has implications for the development of a literate society.

Award #236338 (PI Coley) – addresses the development of folk biological reasoning in urban vs. rural children.

**B.2 OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."**

Comments:

All of the awards resulted in peer-review publications and conference presentations. In addition, several awards focusing on language, thought, and spatial understanding have direct connections to learning. Other awards address important questions about social development (e.g., parenting, emotion processing) that impact social functioning later in life.

Illustrations can be found in the following:

Award #414302 (PI Newcombe) – young children's ability to use geometry of surrounding surfaces to maintain their spatial orientation

Award #443590 (PI Grotevant) – the implications of open adoption.

Nugget #11158 (PI Kurtz-Costes & Rowley) – factors directing African-American youth achievement

Nugget #8806 (PI Choi) – addressing the relation among culture, language, and thought.

**B.3 OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

Comments:

The projects sampled revealed the development of several important tools. Illustrations can be found in the following:

Award #528012 (PI Little) – workshop on conventions for working with dyadic data designs.

Nugget #11942 (PI Reyna) - mathematical models that enabled the extraction of underlying abilities in learning, memory and development.

Nugget #8808 (PI Morrison) – an objective measure of self-regulation in children, the "heads to toes" task.

Nugget #11948 (PI Wilcox) – assessed a new method near-infrared spectroscopy (NIRS) to study neural processing in infants.

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[28]**

As with most external reviews of institutions, we see areas for improvement in business practices, but we also recognize the pro-active attempts to use innovative processes (e.g., FastLane).

Comments:

## PART C. OTHER TOPICS

### C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.

The single biggest problem is under funding. Only 21 standard proposals were funded during the entire review period encompassing topics across all areas of developmental psychology. This yield is disproportionate to the amount of time and energy devoted to the proposal process – preparation, review, and revision. This has a deleterious effect on the field. New ideas are constrained or lost, careers are truncated or aborted, and science suffers due to availability of resources.

### C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

### C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

We want to highlight again the problems with exclusively nonpermanent staffing. This impacts the turnover of the panel too. In Fall 2005, only 50% of panelists had previously served.

### C.4 Please provide comments on any other issues the COV feels are relevant.

**Recommendation:** We recommend development of a process for a wider conversation and generation of the list of areas described as "Frontier Research" (see Section IV in Program Officer's report). It is unclear how best to do this, but the current list is uneven. Some areas are too specific, some are too broad, and some are good basic research questions but not really "frontier".

We understand the SBE is no longer represented on the National Science Board and this should be rectified.

On a number of occasions, we noted inaccurate and incomplete data (e.g., geographic distribution). We urge the development of a searchable and relational database.

[28] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

Staff support before the meeting was superb. It might be helpful to refer us to a specific website with particulars (map, lodging, instructions, agendas, etc).

**SIGNATURE BLOCK:**
Martha Arterberry
Lynn Liben
Valeria Reyna

_____
For the 2006 BCS COV

# Geography & Regional Science

| |
|---|
| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: GEOGRAPHY & REGIONAL SCIENCE** |
| **Division: BCS** |
| **Directorate: SBE** |

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

### A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[29] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br>Comments:<br>**This is an appropriate mechanism to review proposals. Considerable effort is placed on ensuring the advantages provided by the different reviews in the analysis.** | **Yes** |
| 2. Is the review process efficient and effective?<br>Comments: **Yes, even with the limited number of NSF personnel available to conduct the review process. The review process seems efficient and produces good results, helpful to the PIs. Occasional direct contact with potential reviewers may increase the rate of reviewer returns for especially innovative or cross-disciplinary proposals.** | **Yes** |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?<br>Comments: **Yes. It is especially useful to have a program officer's summary because he/she provides insights that can only be added from the broad perspective of having seen the many proposals and understanding how they fit within programmatic priorities.** | **Yes** |

[29] If "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br>Comments:<br>**Yes, the responses are clear and easy to understand.** | **Yes** |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br>Comments: **The documentation follows a very clear template, ensuring that the panel and program officer address both review criteria and put the given proposal's assessment in the context of the proposals in that round. The program officers' use of "program officer notes" to add to the interpretation is especially helpful.** | **Yes** |
| 6. Is the time to decision appropriate?<br>Comments: **The time from proposal target date or deadline to program officer's response was 6 months for 87% to 97% of the proposals during the past three years. This is appropriate.** | **Yes** |
| 7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:<br><br>**We recommend updating the NSF reviewer database. The Association of American Geographers is willing to assist in this effort, if desired.** | |

## A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[30] |
|---|---|
| 1. Have the individual reviews (either mail or panel) addressed both merit review criteria?<br>Comments: **The vast majority of the proposals evaluated contained appropriate responses to the review criteria concerning scientific merit and impact.** | **Yes** |

[30] In "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| 2. Have the panel summaries addressed both merit review criteria?<br>Comments:<br>**It is a requirement of the panel summaries that they address these criteria. They were addressed in all cases.** | **Yes** |
| 3. Have the *review analyses* (Form 7s) addressed both merit review criteria?<br>Comments: **Yes, however, it appears that some of the reviewers are still unclear how to assess the relevance of the science to society.** | **Yes** |
| 4. Additional comments with respect to implementation of NSF's merit review criteria:<br><br>**Greater clarity and more examples of the "broader impacts" would help both proposers and reviewers. Geographic research frequently addresses issues of significant broader impact to society, but reviewers and proposers seemed to hold inconsistent perceptions of how these should be characterized.** | |

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| **SELECTION OF REVIEWERS** | **YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[31]** |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br>Comments: | **Yes** |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br>Comments:<br>**It is clear that the program officers make good attempts to select appropriate reviewers. Electronic communication may make it possible to elicit reviews from "tardy" reviewers when those reviewers are key to assessing some particular element of a proposal.** | **Yes** |

[31] If "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| **Selection of a good subdisciplinary and methodological mix of panelists is key for the dissertation panel, which relies on panelists' reviews. Toward this end, program officers should watch for trends in the subdisciplines and methodologies represented in the mix of dissertation-improvement proposals.** | |
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[32]<br>Comments: **The program uses a good distribution of reviewers among academic institutions, with research intensive institutions appropriately being the most highly represented. However, non-academic institutions also have researchers with geography and regional science expertise. Private industry, NGOs, and federal agencies conduct relevant research and are sources of reviewers who could be tapped. This would help transfer knowledge in both directions between academia and those sectors. Also, it was difficult to determine if underrepresented groups are included in the review process. A focus on Historically Black Colleges and Universities, and institutions catering to Native Americans or Hispanic populations might yield new reviewers and increase knowledge transfer among researchers.** | **Yes** |
| 4. Did the program recognize and resolve conflicts of interest when appropriate?<br>Comments:<br>**The program pays careful attention to explaining and resolving potential COIs.** | **Yes** |
| 5. Additional comments on reviewer selection: **The database of potential reviewers is out of date. It should be updated and put into an easily usable format to help simplify the large task of identifying reviewers for the proposals. In addition, an effort should be made to contact appropriate NGOs, private industry, and federal government representatives to determine if they are willing to participate in reviews.** | |

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[33], OR DATA NOT AVAILABLE |
|---|---|

[32] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

[33] If "Not Appropriate" please explain why in the "Comments" section.

| | |
|---|---|
| 1. Overall quality of the research and/or education projects supported by the program.<br>Comments: | **Appropriate** |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br>Comments: | **Appropriate** |
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[34]<br>Comments:<br>**There are multiple, distinct dimensions to investing in scientific research, including risk, innovation, and potential impact. NSF should consider all these when making investments. Because the GRS disciplines are evolving, there will be and should be innovative proposals. Funding risky proposals is appropriate provided there is a potential substantial impact. The proposals reviewed show that risky proposals were appropriately accepted. Some very good proposals of lower risk and lower impact were declined due to lack of funds.** | **Appropriate** |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br>Comments:<br>**In addition to interdisciplinary projects funded by GRS, the program directors participate actively in NSF's cross disciplinary activities and programs, as well as those outside of NSF.**<br>**The geographic research community, which is itself highly interdisciplinary, has responded well to this activity and the important research opportunities they present**. | **Appropriate** |
| 5. Does the program portfolio have an appropriate balance of:<br>• Funding for centers, groups and awards to individuals?<br>Comments: | **Appropriate** |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators?<br>Comments: | **Appropriate** |

[34] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

| | |
|---|---|
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br>Comments:<br>**The record shows that the geographic distribution of proposals is broad, encompassing all 50 states plus the District of Columbia. During the three year period, awards were made to institutions in all but 7 states.** | **Appropriate** |
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br>Comments: **There is an appropriate mix of academic institutions, with more research grants given to institutions specializing in research yet some being given to other academic institutions when the proposals are of sufficient merit. However, with the substantial cutting edge research in geography, particularly in the geographic science and technology subfields, now conducted in the private sector, NSF should seek ways access and coordinate with that knowledge base and innovation. In addition, although NGOs and Federal agencies usually conduct applied research, some fundamental research is also conducted in those organizations. NSF should find ways to tap into that intellectual base as well.** | **Appropriate** |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br>Comments: | **Appropriate** |
| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities?<br>Comments: | **Appropriate** |
| 11. Does the program portfolio have appropriate participation of underrepresented groups?<br>Comments:<br>**The program faces two difficulties: the real underrepresentation of nonwhites and Latina/o scholars in American academic geography, and the increased tendency of US residents not to disclose their ethnicity. From the data available on proposal submissions, awardees, and members of the relevant research communities, we conclude that the program's reviewers, panelists, PIs, and successful PIs do represent the mix in the communities. Continued efforts to involve minorities of all sorts would likely strengthen the mix of research and research approaches in the disciplines.** | **Appropriate** |

| | |
|---|---|
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br>Comments:<br>**The GRS program has been proactive in identifying and funding significant new trends in the discipline of geography, and also in fostering and linking research to the agency mission and to broader societal and national priorities. See Part B 1-3 for citations of relevant reports.** | **Appropriate** |
| 13. Additional comments on the quality of the projects or the balance of the portfolio:<br>**It would be useful for NSF's database to include the names, genders, and ethnic backgrounds of the doctoral students whose dissertation research is being partially funded through DDI awards. Is it possible to begin to enter this information when DDI proposals are submitted?** | |

**A.5 Management of the program under review**. Please comment on:

| |
|---|
| 1. Management of the program.<br>Comments: **Excellent** |
| 2. Responsiveness of the program to emerging research and education opportunities.<br>Comments:<br>**The program has been very responsive to emerging trends and opportunities in geography. Its funding of GIScience initiatives, human-natural interactions, and research guided by critical social theory, for examples, has helped create a more central role for geography in the university and in society.** |
| 3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.<br>Comments: **In response to the 2003 Committee of Visitors' report, the Geography and Regional Science program invited former program officers and other disciplinary leaders to a workshop focusing on strategic options for the program. The topic of the workshop was a strategy for the future. We commend GRS for initiating this process, and recommend that a final report be prepared from the workshop, making use of subsequent input and the Foundation's and Directorate's strategic plans.** |
| 4. Additional comments on program management:<br>**From the mid-1980s through the mid-1990s, the GRS program funded a highly successful, though costly and risky project, the National Center for Geographic Information and Analysis.** |

**This was a transformative project that helped advance and rejuvenate geography. The time may be right for another major project. One such project, for example, might aim to revitalize regional studies, to help increase domestic awareness of our international neighbors and the issues that face us in an increasingly globalizing world. This initiative could reexamine traditional regional studies with the view of modernizing the intellectual approach and developing and launching an implementation strategy for renewed effort in regional studies.**

## PART B. RESULTS OF NSF INVESTMENTS

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
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- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

### B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

**B.1 <u>OUTCOME GOAL for PEOPLE</u>: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

**<u>The examples below suggest the varied ways in which NSF awards can achieve this goal.</u>**

***Examples of Outcomes for People:***

## Using GIS to Determine and Understand Neighborhood Needs

Critical to the success of the project are the experiential learning activities undertaken by undergraduate students, who will work with these organizations to plan and implement GIS-based spatial analysis projects using these data. Community organization staff also will receive GIS training. Through the educational activities, university students' skills for and commitments to public service and active citizenship will be enhanced. Two community organizations in an impoverished Chicago neighborhood will enhance their technological and knowledge infrastructures through the project's investment of hardware, software, training, and data needed for long-term sustained GIS capabilities. Because these communities have high proportions of African American and Hispanic populations, the project should expose many students and community members who are members of underrepresented groups to scientific inquiry.

*NSF Award Numbers:*
0237980
Award Title: CAREER: Transforming the Politics of Place: GIS, Knowledge Production, and Community-Based Organizations in Urban Governance
PI Name: Sarah Elwood
Institution Name: DePaul University

## Tennessee Teacher Experiences Excitement of Costa Rican Fieldwork

Participation in this NSF-funded project provided Lafrenz with horizon-broadening international field experience and first-hand knowledge of scientific research. Many K-12 teachers have not had the opportunity to experience the excitement of research as discovery, and as a result, they have trouble developing inquiry-based learning assignments for their own students. By providing the opportunity for Lafrenz to engage in scientific field research and discovery, university-based researchers have increased her interest in and capacity for providing research opportunities for her students that can help invigorate the scientific curriculum in her classroom and in her school.

*NSF Award Numbers:*
0242286
Award Title: Lake-Sediment Records of Holocene Droughts, Indigenous Agriculture, and Prehispanic Vegetation and Fire Regimes in Northwestern Costa Rica
PI Name: Sally Horn
Institution Name: University of Tennessee Knoxville

## Geographers Discover Los Angeles Area Residents to Be Far Less Segregated at Work Than in Their Residential Neighborhoods

Multi-institutional collaborations have generated new insights about contemporary social problems, yielding new insights for researchers and policy makers.

*NSF Award Numbers:*
9986928
Award Title: Collaborative Research: Residential Segregation and the Spatial Division of Labor of Immigrants in Los Angeles
PI Name: Mark Ellis
Institution Name: University of Washington
9986877
Award Title: Collaborative Research: Residential Segregation and the Spatial Division of Labor of Immigrants in Los Angeles
PI Name: Richard Wright
Institution Name: Dartmouth College

## Analysis of corporate citizenship in Ciudad Juarez shows interplay of local and global forces

The conclusions from this project are notable because they demonstrate how globalization is not a top-down process through which powerful corporations shape society. Instead, globalization is better understood as a constant give-and-take across local and global scales. While global firms control much economic power, they are vulnerable to changes in social attitudes regarding responsible civic behavior.

*NSF Award Numbers:*
0215522
Award Title: Corporate Citizenship and Local-Global Alliances: A Case From Ciudad Juarez

PI Name: Melissa Wright
Institution Name: Pennsylvania State Univ University Park

## Geographers explore successes in Bosnian resettlement

This research is significant because it seeks to explain the complex dynamics affecting return migration in post-war societies by using a combined research approach. First, the researchers spent significant time in Bosnia, conducting interviews with displaced persons, local mayors, international agency heads, and community leaders. These rich data sources provide important grounded and institutional contexts for understanding the human security factors affecting return. Second, the researchers tracked returns by collecting field statistics, compiling them into a geographic information system. This allowed for an empirical comparison of pre-war census data and post-war displacement statistics to better understand the shifting population geography of Bosnia. Third, through integrated analyses of these data, the researchers gained understanding regarding how patterns of displacement and return are altering Bosnia's political geography and at least partially reversing ethnic cleansing. Results of this research provided the basis for the testimony presented by one of the investigators at a hearing of the before U.S House of Representatives, Committee on International Relations, Subcommittee on Europe and Emerging Threats, on April 6, 2005.
*NSF Award Numbers:*
0137106
Award Title: Collaborative Research: Remaking Bosnia: The International Community and the Returnee Policy Process in Three Bosnian Localities
PI Name: Gerard Toal
Institution Name: Virginia Polytechnic Institute and State University
0136847
Award Title: Collaborative Research: Remaking Bosnia: The International Community and the Returnee Policy Process in Three Bosnian Localities
PI Name: Carl Dahlman
Institution Name: University South Carolina Research Foundation

## Traditional views are challenged in a geographic analysis of rural poverty in the U.S. Northwest

This project is noteworthy because it provides new insights into the complex dynamics that affect rural poverty among different groups across in different parts of the U.S. Northwest. Research results enhance both basic understanding and theory about the factors that interact to produce poverty, and they shed light that can enable governments at different levels as well as other groups to address the fundamental causes of poverty in a region that appears to be prospering.
*NSF Award Numbers:*
0136703
Award Title: Interpreting Geographies of Poverty: Rural Gentrification and White Poverty in the American Northwest
PI Name: Victoria Lawson
Institution Name: University of Washington

### B.2 OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."

***Examples of Outcomes for Ideas:***

## Predicting Avalanches

On a practical level, the work will provide critically relevant insights for avalanche professionals working to protect life and property. In addition to being an adjunct faculty member at Montana State, Birkeland works as a snow scientist with the U.S. Forest Service. A special facet of this project is partnership between the investigators and the USFS-related network of snow specialists at ski areas throughout the nation. The results of this research will be rapidly transmitted to these snow specialists, thereby enabling their prompt use in improving avalanche-forecasting capabilities at U.S. ski areas. The results therefore will improve avalanche mitigation efforts that protect ski areas and highway corridors. Finally, this work will benefit society by providing important new information for all people playing in, working in, living in, and traveling through mountain environments.
*NSF Award Numbers:*
0240310
Award Title: Temporal Changes in the Spatial Variability of Snow Stability

PI Name: Katherine Hansen
Institution Name: Montana State University

## CAREER Awardee Gains New Insights into How Children View Urban Places

This project advances fundamental understandings of the ways that children conceive of and operate in geographic settings. The project therefore provides a sounder foundation for educational efforts designed to enhance and improve the geographic knowledge and skills of children, and it provides insights into the ways that places can be designed to be more amenable to children.
*NSF Award Numbers:*
9984876
Award Title: CAREER: Children's Concepts of Urban Space and the Development of Urban Geographic Learning in Low-Income School Districts
PI Name: Meghan Cope
Institution Name: SUNY at Buffalo

## Geographic Patterns of Poverty Analyzed Across and Within the Los Angeles Metropolitan Area

This project will enhance basic understanding of the ways that changing patterns of economic activity and employment are altering spatial distributions of poverty in contemporary cities as well as the impacts those changes are having on neighborhoods and municipalities.
*NSF Award Numbers:*
0112475
Award Title: Intrametropolitan Division of Labor and the Public Cost of Working Poverty
PI Name: Jennifer Wolch
Institution Name: University of Southern California

## Interdisciplinary Team Models Interactions Among Urban Development, Land-Cover Change, and Bird Diversity

This project provided fundamental new knowledge about the complex interactions of human and natural systems in and around metropolitan areas, and it developed new tools that were adopted by local and regional policy making groups.
*NSF Award Numbers:*
0120024
Award Title: BE/CNH: Modeling Interactions Among Urban Development, Land-Cover Change, and Bird Diversity
PI Name: Marina Alberti
Institution Name: University of Washington

## Interdisciplinary Project Explores Interactions Between Land Use and Climate Change at Regional and Local Scales in Eastern Africa

This project brings together a multidisciplinary team of scientists and students from a number of different nations to develop fundamental new insights into the dynamic interactions among human land-use decision making, regional and local climates, and other natural systems.
*NSF Award Numbers:*
0308420
Award Title: BE/CNH: An Integrated Analysis of Regional Land-Climate Interactions
PI Name: David Campbell
Institution Name: Michigan State University

## Combining Economic and Ecological Indicators to Prioritize Wetlands Restoration Projects Using Geographic Information Systems

This interdisciplinary project developed a natural resource decision-support tool in coordination with state officials so that the attitudes of people regarding different ecological characteristics can be incorporated into decisions about restoring specific wetlands.
*NSF Award Numbers:*
9900678

Award Title: Combining Economic and Ecological Indicators to Prioritize Wetlands Restoration Projects Within a Spatial GIS Framework
PI Name: James Opaluch
Institution Name: University of Rhode Island

**USC Researcher Explores Relationships Between Land-Use Patterns and Individual Mobility in the United States and Great Britain**

This project adds to fundamental knowledge about the interactions betweem land-use patterns and travel behavior through a comparative study of the United States and Great Britain.
*NSF Award Numbers:*
0137029
Award Title: Transportation and Land Use: A Comparative Analysis
PI Name: Genevieve Giuliano
Institution Name: University of Southern California

**Geospatial concept understanding and recognition in students of different ages assists in the development of age-appropriate use of GIS at different educational levels**

This work is notable because it shows that it is possible to create a multi-level task ontology that can be used to suggest appropriate age/grade levels for the introduction of real world and abstract spatial and geospatial concepts into various existing K-12 curricula without having to create a new curriculum. Existing "standards" for K-12 concept presentation, such as the National Standards for Geography or the National Standards for the Social Sciences, can be evaluated in terms of the task ontology to see if they are being introduced in a meaningful, natural way for children to comprehend.
*NSF Award Numbers:*
0239883
Award Title: Spatial Thinking and Reasoning
PI Name: Reginald Golledge
Institution Name: University of California-Santa Barbara

**NRC study highlights the important of spatial thinking in the development of K-12 curricula**

This study has been notable because it points to a fundamental need in American education. Students need to be equipped with lifelong learning skills to face the challenges of a technologically changing world. All students can benefit from learning to think spatially, as it is an integrator and facilitator for problem solving across many subjects. GIS, for example, is an important tool for students to learn because it can help prepare them for careers in science and technology, for example being a city planner, architect, emergency management official, or air traffic controller. GIS can also accommodate different types of learners at varying educational levels and can be adapted for a range of settings. The committee also encouraged development of a national initiative to integrate spatial thinking across the K-12 curricula in courses like mathematics, history, and science. Ultimately, this initiative could result in a generation of students who engage in spatial thinking to achieve success throughout their lives as citizens and members of the 21st century workforce.
*NSF Award Numbers:*
0076284
Award Title: Thinking Spatially: The Incorporation of Geographic Information Science Across the K-12 Curriculum
PI Name: Anthony de Souza
Institution Name: National Academy of Sciences

**B.3 OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

***Examples of Outcomes for Tools:***

**Social Scientists Trained to Use New Spatial Analytic Tools**

Through these and other activities, CSISS advances the development of spatial analytic tools that can be used across a broad range of disciplines, and it provides training to researchers to enhance their analytic capabilities. Special emphasis has been given to training researchers at early stages of their careers, thereby increasingly the

likelihood that the investment in CSISS will pay off over many decades in the future.
*NSF Award Numbers:*
9978058
Award Title: Center for Spatially Integrated Social Science
PI Name: Michael Goodchild
Institution Name: University of California-Santa Barbara

## Laser-scanning techniques are adapted to collect critical data about rock art

This work is notable because the terrestrial laser scanner provides an innovative, non-destructive method to quickly and efficiently record four levels of spatial data. Previously, multiple techniques, some of which were detrimental to the site, were required to record a site. The laser-scanning results provide data critical to management, preservation, and restoration of heritage sites. The method captures near archive quality, three-dimensional data of a site and preserves the uniqueness of the site for future researchers and for the public to investigate in a virtual reality environment should the site deteriorate. The laser-scanning method aids curators and helps in site management. Repeat scans of a site are done rapidly and cost efficiently. The rapid surveys can be used to detect natural deterioration of the sites as well as monitor increased deterioration associated with site visitation. Furthermore, the initial scans provide baseline information that can be used to set a level of restoration as the site declines through time.
*NSF Award Numbers:*
0239749
Award Title: CAREER: Alluvial Fan Form Quantification to Advance Geographic Science and Education
PI Name: Thad Wasklewicz
Institution Name: University of Memphis

## General theory of geographic information is developed to facilitate effective use of GIS

This collaborative project's accomplishments are notable because a refined general theory of geographic information will facilitate interoperatibility among different databases, thereby reducing unnecessary complexity and enhancing capabilities of geographic information systems for scholarly research and a diverse range of practical applications.
*NSF Award Numbers:*
0416208
Award Title: Collaborative Research: Integration of Geographic Complexity and Dynamics in Geographic Information Systems
PI Name: May Yuan
Institution Name: University of Oklahoma Norman Campus
0416300
Award Title: Collaborative Research: Integration of Geographic Complexity and Dynamics into Geographic Information Systems
PI Name: Thomas Cova
Institution Name: University of Utah
0417131
Award Title: Collaborative Research: Integration of Geographic Complexity and Dynamics into Geographic Information Systems
PI Name: Michael Goodchild
Institution Name: University of California-Santa Barbara

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[35]**

The NSF Geography and Regional Science Program is a model of administrative and scientific excellence. It performs a wide range of complex and detailed work on behalf of the NSF and the geographic research community. It responds with agility and innovation to rapidly evolving scientific needs of the discipline of geography and to the priorities of the NSF. It does so with a small staff, a limited budget, and with good cheer.

# PART C. OTHER TOPICS

**C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.**

**Within our time limits, the COV examined the structure, content, and execution of the GRS program. We conclude that the GRS program is well run and provides outstanding opportunities for advancing the sciences. The COV process is a clear example of the willingness of NSF to ensure all aspects of the program get transparent review.**

**To identify key trends and needs, a workshop or series of workshops should be held to identify future needs. Examples of topics include:**

- **human nature interactions (for example hazards and vulnerability research),**
- **regional studies,**
- **medical geography and epidemiology,**
- **cyber infrastructure, (including large scale of GIS systems, spatial temporal dynamics, interactive GIS/GPS systems, and their relation to other disciplines; capacity building, workforce development and forecasting),**
- **International Polar Year.**

**C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.**

**Funding success rates for regular proposals, which traditionally were in the low-20 percent range during the 1990s, have dropped to the upper-teen percent range,**

[35] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

**largely because more proposals and larger proposals have been submitted than traditionally was the case. This had been a goal of the program (and of NSF). It is important that success rates not fall further, or else the most talented PIs will focus their energies elsewhere, and less experienced PIs will be severely discouraged.**

**The Doctoral Dissertation Improvement program is very important for the discipline. While we understand that most programs in the Division do not sponsor such competitions, for Geography and Regional Science the DDI competition improves:**

- **doctoral education across the field, because more students expect to and are expected to prepare more-complete research proposals.**
- **academic research in real time, because more research is done under appropriate methodological circumstances (longer-term fieldwork, better data sets, etc.).**
- **academic work in the future, because the students who prepare proposals and especially the students who benefit from awards become better and more ambitious researchers.**
- **scientific participation of women and members of minority groups, who are more widely represented in the doctoral student body than in the professoriate. Does this hold up in the NSF GRS data? Are the students involved more diverse than the lead PIs for DDIs or "regular" proposals and awards?**

**C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.**

**Provide examples of excellent ways in which behavioral and social science research has met the subcategories of the "broader impact" criterion – to help proposal writers and reviewers imagine the possibilities.**

**Develop research-based suggestions to program officers and panels regarding strategies to increase the involvement of underrepresented groups in program activities (proposals, reviewers, and awards).**

**Place more emphasis on highly innovative research (at least, such research that has the potential for broad impacts).**

**Begin collecting data on the gender and ethnicity of doctoral students whose dissertation research is partially funded through the DDI opportunity.**

**Data collected by scientists are not always archived and made available in a readily accessible manner. NSF has a requirement that scientists do so. Methods must be developed to improve scientists' willingness and ability to archive and make data available.**

**C.4 Please provide comments on any other issues the COV feels are relevant.**

**<u>Subdisciplinary distribution</u>. We were interested in the subdisciplinary distribution of proposals received by and awards made by the GRS program. We undertook a very quick analysis of all awards during the FY2003-05 period, and all "regular" (non-dissertation, non-special program) proposals reviewed by the Spring 2002 and Autumn 2003 panels. Using a widely recognized division of disciplinary foci, we found:**

| | Regular Proposals, Spr 2002 & Aut 2003[36] | Awards, FY2003-05 | DDI awards, FY2003-05 | Regular Awards, FY2003-05 |
|---|---|---|---|---|
| **GISci** | **13%** | **7-10%** | **0-2%** | **10-13%** |
| **Human** | **32%** | **31-32%** | **34-36%** | **31%** |
| **Natural/Env'tal** | **28%** | **32-36%** | **36%** | **31-36%** |
| **Nature/Society** | **27%** | **24-27%** | **26-28%** | **21%** |
| **Absolute #** | | ***143*** | ***53*** | ***85*** |

**It would be useful to improve this quick analysis, and monitor these trends over time.**

**<u>International awareness and competitiveness</u>. Global issues permeate SBE activities. Many countries, especially in Asia and Europe, are increasing their efforts to attract high caliber international students. In order to remain the world's "gold standard" for scientific organizations, NSF must recognize these and other changes in the international scientific community and develop strategies to maintain the leadership position of US science. This should include, among others: evaluating innovative models for funding and conducting research and implementing those that are appropriate; identifying opportunities and methods of ensuring bright international students continue to participate in US science; developing effective approaches to participate with the changing international scientific community; and stimulating young students at the k-12 level to be interested in science.**

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

- **The COV process is excellent. It reflects considerable effort by the NSF staff and the reviewers. The openness of the NSF to review should be a model to other federal agencies.**
- **The report template was a significant aid to the COV in evaluating the program.**

[36] Based on an analysis of regular proposals in the Spring 2002 and Autumn 2003 rounds, counting collaborative proposals as separate proposals, and not counting proposals based in other programs or in other competitions (e.g., ITA).

- **Given that the crux of the process and the report template relates to the individual program, a higher proportion of time might well be allocated to program-specific discussion, review, and report preparation.**

- **Providing overarching questions and designating a facilitator and a rapporteur would improve the general and the cross-cutting discussions.**

**SIGNATURE BLOCK:**
J.W. Harrington
John Kelmelis
Douglas Richardson

_____
For the 2006 BCS COV

# Linguistics

| |
|---|
| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: LINGUISTICS** |
| **Division: BCS** |
| **Directorate: SBE** |

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

### A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.

Provide comments in the space below the question. Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[37] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br>Comments:<br><br>The mechanism of including both panels and ad hoc reviews should be maintained. The current program director has done an excellent job of increasing the responsiveness of ad hoc reviewers and of balancing the different strengths of panel discussion and ad hoc reviewer comments. She has also done a good job of expanding the reviewer pool and of reaching out to new members of the community. | yes |
| 2. Is the review process efficient and effective?<br>Comments:<br><br>Does it address distribution of the field? | Yes |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?<br>Comments: | Yes |

[37] If "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br><br>Comments: Panel summaries are provided for funded proposals, proposals that are recommended for revision, and declined proposals. The panel summaries for the latter two categories are sufficiently detailed to help the proposer understand the decision and to revise and resubmit. | Yes |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br>Comments: | Yes |
| 6. Is the time to decision appropriate?<br>Comments:<br><br>The standard is for 70% of the proposals to be reviewed within 6 months. This program meets the standard. | Yes |
| 7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:<br><br>The program director is able to keep the merit review process from being contaminated by the schisms in the field. | |

**A.2 Questions concerning the implementation of the NSF Merit Review Criteria (<u>intellectual merit</u> and <u>broader impacts</u>) by reviewers and program officers.** Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| **IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA** | **YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[38]** |
|---|---|
| 1. Have the individual reviews (either mail or panel) addressed both merit review criteria?<br>Comments: | Yes |

[38] In "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| 2. Have the panel summaries addressed both merit review criteria?<br>Comments: | Yes |
| 3. Have the *review analyses* (Form 7s) addressed both merit review criteria?<br>Comments: | Yes |
| 4. Additional comments with respect to implementation of NSF's merit review criteria:<br><br>The two merit review criteria areas are so broadly stated that, although everyone addresses them, the responses are essentially incommensurate. | |

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| **SELECTION OF REVIEWERS** | **YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[39]** |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br><br>Comments:<br>The program director has made a conscious effort to increase the number of potential reviewers. All proposals in the sample received at least two ad hoc reviews; most received four or more. | Yes |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br><br>Comments: The program director has made a sustained effort to ensure that the expertise of the reviewer matches the discipline base of the proposal. | Yes |
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[40] | Yes – for geography |

[39] If "Not Applicable" please explain why in the "Comments" section.

[40] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

| | |
|---|---|
| Comments:<br>The panel members are almost exclusively from research institutions; the majority of reviewers are from research institutions. Since most proposals are generated by faculty members at research institutions, this may be an appropriate distribution. However, insofar as there is a desire to increase the diversity of institutions that receive grant funding, there should be a concomitant effort to diversify the panel and reviewer pool with respect to institutional type. | Yes – for gender<br><br>Unknown -- for underrepresented groups<br><br>No – type of institution |
| 4. Did the program recognize and resolve conflicts of interest when appropriate?<br>Comments: | Yes |
| 5. Additional comments on reviewer selection:<br><br>The program director actively solicits new names for the reviewer pool from established researchers. The increase in the response rate over the past three years – from 47% to 68%.—is a testament to her efforts. | |

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[41], OR DATA NOT AVAILABLE |
|---|---|
| 1. Overall quality of the research and/or education projects supported by the program.<br>Comments: | Yes |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br>Comments:<br><br>Awards rarely exceed $100,000 per year (including indirect costs). That is, PIs receive a maximum of roughly $50,000 per year. This seems a relatively small amount, given the increasing costs of research.<br><br>Given the relatively small amount of research dollars available, it might be reasonable to reconsider the relative distribution across conferences, research awards, and dissertation awards, with an eye toward creating the possibility of increased funding for at least some projects of particular significance and more dissertation awards. Since Linguistics supports a larger number of conferences than other NSF programs, this reconsideration | No |

[41] If "Not Appropriate" please explain why in the "Comments" section.

| | |
|---|---|
| may involve a concomitant reduction in conference funding.<br><br>We also understand that dissertation awards in the Linguistics program support direct expenses only (e.g. travel) and that they do not provide fellowship support. We recommend that this policy be reexamined.<br><br>In view of the limited availability of funds and the desire to broaden research support, we recommend a study of the efficacy of career awards, with an eye to determining the impact that the recipients make on the field relative to project-based awards. | |
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[42]<br>Comments:<br><br>Two factors militate against funding innovative/high-risk projects in the Linguistics program. One is the relatively small budget. It is difficult to take risks when funding is not sufficient to support the number of good proposals, in the first place. The second factor is the fact that the core linguistic disciplines of phonology, syntax, semantics and morphology absorb a disproportionately small portion of the total funding, as noted in response to question 10 below. When much of available funding must go to support infrastructure needs, high-risk projects suffer. | no |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br><br>Comments: Most successful proposals draw from subparts of linguistics – e.g. combining theoretical syntax with typological investigations. | Yes |
| 5. Does the program portfolio have an appropriate balance of:<br>• Funding for centers, groups and awards to individuals?<br><br>Comments: Program does not fund centers, as a matter of policy, because of the size of budget. | NA |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators?<br>Comments: | Yes |
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br><br>Comments:<br>The portfolio's geographical distribution is consistent with the distribution of research universities. | Yes |

[42] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

| | |
|---|---|
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br><br>Comments:<br>As represented in the sample, the overall portfolio is overwhelmingly tilted towards doctorate-granting institutions. The sample of 75 proposals includes only one from a liberal arts college, two from master's degree institutions, and two from American Indian tribal organizations. (It includes none from historically black institutions.) The funding portfolio is slightly more skewed, since neither of the master's degree institutions and neither of the American Indian tribal organizations were funded. The problem may very well be a consequence of the environment at non-doctoral institutions, but increasing outreach to this kind of institution could improve the situation. | No |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br>Comments: | yes |
| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities?<br><br>Comments:<br>The core subdisciplines of Linguistics (syntax, semantics, morphology and theoretical phonology) appear to be under-represented in the portfolio. This is potentially a very serious problem. Students reasonably flock to where the funding is. If they move in significant numbers away from the core subdisciplines, the field is seriously weakened.<br><br>Part of what drives the distribution of funding has to do with the fact that linguistic fieldwork or psycholinguistic research depends on external funding, while the need for funding in the core subdisciplines may be less obvious. But the need is no less real. | No |
| 11. Does the program portfolio have appropriate participation of underrepresented groups?<br><br>Comments:<br>We don't have enough data to make a judgment in regard to ethnic minorities. We urge NSF to do a better job of collecting information on the representation of ethnic minorities among proposers and reviewers. Minority institutions may be an untapped resource in regard to a population from which proposers and reviewers may be drawn.<br><br>The data on women are conflicting. The program director's statistics indicate that 65% of awardees (including dissertation writers) are women. But the official statistics indicate only a third of awardees are women. If the first number is accurate, the representation of women is high, in a field where the | Data are either unavailable or unreliable |

| | |
|---|---|
| graduate student population is roughly at parity. If the latter number is accurate, the representation of women is low.<br><br>The issue of having sufficient data to answer this question was raised in the previous COV report. We are disappointed that so little progress has been made on this score. | |
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br>Comments: | Yes |
| 13. Additional comments on the quality of the projects or the balance of the portfolio: | |

**A.5 Management of the program under review**. Please comment on:

1. Management of the program.

Comments:
The current program director has done an excellent job of managing resources, of increasing the responsiveness of adhoc reviewers, and of reaching out to new populations. We do not believe, however, that management of the program is a one-person job. The volume of work involved in keeping the review process running smoothly makes it difficult to perform the kind of outreach activities needed to increase the participation of non-research colleges and universities. We understand that there is the possibility of adding a second program director and that one of the two will be a permanent position. This development will address the management problem. It will also resolve another programmatic issue. When the only program director is temporary, institutional memory is faulty at best.

However, we must note that creating a permanent program director position carries its own problems. Given that the field is rapidly evolving and that research funding comes almost exclusively from NSF, a longterm program director may either become out of touch or exercise undue influence. Therefore, we recommend consideration be given to appointing two rotating program director with overlapping terms, as another way of addressing the problems of management and institutional memory.

2. Responsiveness of the program to emerging research and education opportunities.

Comments: The initiative to fund research on endangered languages is timely and important.

The occasional collaboration between the Linguistics program and both Education and Human

Resources and the Developmental Learning Sciences is encouraging and should broaden in view of the growing linguistic diversity in the K-12 population.

We recommend that the program consider how to respond to the current national language priorities identified by the government, e.g. Arabic, Pashto, Farsi and Dari. This could be a golden opportunity for linguists to have national visibility.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments: We noted in A-4-10 above that the core subdisciplines of Linguistics (syntax, semantics, morphology and theoretical phonology) appear to be under-represented in the program portfolio and that this situation threatens the health of the field. We recommend a consideration of how the imbalance can be redressed.

4. Additional comments on program management:

## PART B. RESULTS OF NSF INVESTMENTS

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment

tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

**B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.**

**B.1 OUTCOME GOAL for PEOPLE: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

Comments: While linguistics department are attracting increasing numbers of women into graduate programs and the discipline, far less success has occurred with respect to racial and ethnic minorities. Some institutions have reported some success in attracting students of color by advancing research opportunities that provide opportunities for such students to explore topics that allow direct or implied implications or applications to subjects of particular interest, e.g. possible value to minority communities. One such project – nugget 11055 – James Rementer of the Delaware Tribe (NSF0214422) is conducting highly significant work that may be of interest to Native Americans of the Lenape people and language (The traditional home of the Lenape people was in Delaware, Eastern Pennsylvania and New Jersey.) Research of this type – which serves to connect people to their past and their heritage – could be useful in attracting more Native Americans and other minorities to the field of linguistics through research efforts that connect them to their histories and past.

The project by Jennifer Bloomquist from Gettysburg College (NSF0418086) hits a number of important points in this area: It involves a liberal arts college, a minority PI, and the study of a neglected linguistic area. (nugget 12315)

**B.2 OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."**

Comments:

The work by Maria Polinsky (UCSD) and Eric Potsdam (University of Florida) (NSF0131946 and NSF0131993) provides a theoretical framework to help describe minority endangered languages. (nugget 11926)

The research led by Diane Brentari of Purdue (NSF0112391 and nugget 11954) sheds new light on the structure, variability and development of a wide range of sign languages around the world.

**B.3 OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

Comments:

The work by Judith Kroll (NSF0418071) at Pennsylvania State University on reading and speaking words in two languages provides an example of psycholinguistic research the results of which could enhance academic learning. (nugget 11047)

The work by Brian MacWhinney of Carnegie-Mellon (nugget 12314 and NSF9978056) provides an

internet-accessible database for sharing transcript and video data across the scholarly community. This research yields a reliable way for social scientists to make their recordings and transcripts publicly available, thus providing

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[43]**

N/A

Comments:

# PART C. OTHER TOPICS

**C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.**

We have mentioned above our concern about funding for linguistics' core subdisciplines and its potential impact on the field. We reiterate our concern here.

Better data gathering is essential. We noted above that the program director's statistics are not consistent with NSF's statistics. It should be possible for NSF to develop a reliable data management system.

**C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.**

**C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.**

Collaboration across the NSF program areas could be improved. The Linguistics Program, in particular, should be part of decisions about research on learning, on education, and on computational models, insofar as these have language components.

There appears to be a lack of institutional memory, a consequence in part of rotating program directors. (However, institutional ossification is a potential result of permanent directors.)

The data do not appear to be reliable.

**C.4 Please provide comments on any other issues the COV feels are relevant.**

[43] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

The discussion groups on the morning of the second day were a mixed bag. It wasn't clear whether the purpose was to inspire ideas in the participants or in the members of the directorate. Nor was it clear what was to be done with the ideas that were produced.

Many of the questions asked of the COV (especially in section A-4) depend on access to information that is unavailable or appears unreliable. Furthermore, NSF practice makes determining the right answer almost impossible. For example, the coding of dissertation awards according to race and gender of the dissertation advisor may mask the actual ethnic and gender composition of the research population.

**SIGNATURE BLOCK:**
Joseph Aoun
Susan Steele
Orlando Taylor

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For the 2006 BCS COV

# Perception, Action & Cognition

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|---|
| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: PERCEPTION, ACTION & COGNITION** |
| **Division: BCS** |
| **Directorate: SBE** |
| **The PAC COV viewed 31 unique proposals (i.e., proposals that were chosen to be viewed by only one member of the 3-person team) and 5 shared proposals (i.e., proposals that were chosen to be viewed by two members of the 3-person team).** |

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

### A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[44] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br><br>Comments: We saw no site visits. We reviewed panels and ad hoc reviews. The COV found the review mechanism to be appropriate. | YES |
| 2.Is the review process efficient and effective?<br><br>Comments: In general we found the review process to be efficient, but the solicitation of ad hoc (mail) reviewers to be ineffective (see recommendation on item A3.1). Other aspects of the review process were found to be efficient and effective. | YES |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation? | YES |

[44] If "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| Comments: The COV thought that some reviews could usefully have been more informative and more specific.<br><br>RECOMMENDATION: Reviewers should complete forms (preferably electronic) or at the least be required to use more headings, such as Conceptual Innovation, Adequate Methodology, Investigator's Qualifications. | |
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br><br>Comments: The COV panel summaries were informative to the PIs and were generally better than the reviews at helping the PIs interpret the review process and final decisions. | YES |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br><br>Comments: The COV would have benefited from receiving information such as the relative rankings of the proposals (within a funding round) and how the qualitative funding recommendations (e.g., Excellent, Poor) were combined and weighted in reaching the final decision.<br><br>RECOMMENDATION: Provide COV with more information regarding how the qualitative ratings (e.g. Excellent, Fair) are combined in reaching the funding decision and with the final rankings of the proposals. | YES |
| 6.Is the time to decision appropriate?<br><br>Comments: The COV found the time to decision to be commendable (i.e., over 70% decisions were made within six months). The COV was curious about the percentage, approximately 12%, of proposals that required more than nine months). | YES |
| 7. Additional comments on the quality and effectiveness of the program's use of merit review procedures: NONE | |

**A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.** Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[45] |
|---|---|
| 1.Have the individual reviews (either mail or panel) addressed both merit review criteria?<br><br>Comments: While the COV found that all reviews that the COV viewed did address both merit review criteria, the COV found great variability in the interpretation, implementation, and consideration of the "broader impact" criterion. This may partly reflect the fact that "broader impact" can be achieved in a variety of different ways, including proposals in practical situations, educational training for graduate and/or undergraduate students, outreach to the general public. There was also considerable variation in how seriously such aims were considered in different proposals. To reinforce this goal it would be helpful to require the efforts to be documented in annual Progress Reports.<br><br>RECOMMENDATION: Better specification of the meaning of "broader impact" needs to be given to the applicants and the reviewers.<br>Progress reports should document success in achieving proposed broader impact. | YES |
| 2. Have the panel summaries addressed both merit review criteria?<br><br>Comments: NONE | YES |
| 3. Have the *review analyses* (Form 7s) addressed both merit review criteria?<br><br>Comments: The COV found that in almost every case that we reviewed the review analyses were identical to the panel summaries. | YES |
| 4. Additional comments with respect to implementation of NSF's merit review criteria: NONE | |

[45] In "Not Applicable" please explain why in the "Comments" section.

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| SELECTION OF REVIEWERS | YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[46] |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br><br>Comments: The compliance of the ad hoc reviewers is low, as it has been in the past. The COV members discussed mechanisms for increasing ad hoc reviewer participation (e.g., greater value placed on ad hoc reviewing by peers and universities, in particular during annual merit or promotion review). The COV noted that participation in a standing panel was valued, but the COV was concerned that ad hoc reviewing was not. Another helpful move might be to make the reviewing process more intrinsically rewarding by providing information about the outcome to ad hoc reviewers.<br><br>The COV noted that a sample of proposals appeared to receive only two reviews.<br><br>RECOMMENDATION: NSF work with institutions to increase "value" of ad hoc reviewing in merit and promotion (e.g., contact deans to impress upon them the extreme value of their faculty spending their time in this way). An additional option might be to increase the size of the panels to cover more of the topics to be reviewed.<br><br>RECOMMENDATION: Provide to ad hoc reviewers the "results" of the review process (i.e., other reviews and panel summary), as the Linguistics program currently does.<br><br>RECOMMENDATION: Require a minimum of three reviews for each proposal. | YES |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br><br>Comments: The COV noted that a small number of external reviewers were used repeatedly, presumably because many others declined to serve. We were also concerned by the discrepancy we observed between the distribution of proposals across institutions and the distribution of reviewers, (see comment below, item A.3.2, regarding type of institution, which is relevant to expertise and qualifications.) | YES |

[46] If "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[47]<br><br>Comments: The COV noted with some concern the large difference between the proportion of applicants from Ph.D. research universities (approximately 60%) and the proportion of reviewers from Ph.D. research universities (approximately 35%). The data on participation by underrepresented groups are too minimal to interpret adequately. | YES |
| 4.Did the program recognize and resolve conflicts of interest when appropriate?<br><br>Comments: The COV did not note any conflicts of interest. | YES |
| 5. Additional comments on reviewer selection: | |

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[48], OR DATA NOT AVAILABLE |
|---|---|
| 1.Overall quality of the research and/or education projects supported by the program.<br><br>Comments: The COV found the overall quality of the research and/or education projects supported by the program to be outstanding. Indeed, the COV found it very disappointing that more of the outstanding projects could not be funded. | YES |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br><br>Comments: The COV found the average funds per year to be insufficient given the scope of the projects.<br><br>RECOMMENDATION: The COV recommends a larger NSF budget for PAC. | NO |

[47] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

[48] If "Not Appropriate" please explain why in the "Comments" section.

| | |
|---|---|
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[49]<br><br>Comments: The COV did not identify any notably high-risk projects, although some were highly innovative. These were in general well-planned and provided pilot data that minimized the "risks" of failure or of inconclusive results.<br><br>There is a problem with finding and funding the higher risk innovative proposals through the regular panel system. One good example is the Lewicki proposal, which got ratings of E, G/F, F, F, and a late V. It was generally agreed to be innovative, exciting and important, but was rejected because it was not sufficiently "persuasive". This may well have been the right decision in the context of competing excellent proposals. But on the other hand not all of those were described as exciting, innovative and important with "substantial broader impacts". One possible solution might be to have a separate panel whose mission is to consider innovative and riskier grants, and which would be less likely to cancel ratings of E with those of F. This would probably stimulate the submission of exploratory and novel ideas without of course guaranteeing that they would be funded. At least within the separate panel, there would be less pressure from the competing more standard though excellent grants. | NO |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br><br>Comments: The COV was impressed with the high number of multidisciplinary projects as reflected by the number of proposals submitted to programs other than PAC that were jointly reviewed by PAC (approximately 45% in our sample) and the number of proposals that were submitted to PAC and were jointly reviewed with non-PAC panels (approximately 25% in our sample). | YES |
| 5. Does the program portfolio have an appropriate balance of:<br>• Funding for centers, groups and awards to individuals?<br><br>Comments: The COV viewed only awards to individuals. | N/A |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators?<br>•<br>Comments: The COV noted a tendency to fund more proposals submitted by | YES |

[49] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

| | |
|---|---|
| younger (as opposed to more senior) investigators; however, the COV found the decisions to be appropriate based upon the quality of the proposals. The COV found no easy way to identify and search for Career awards.<br><br>RECOMMENDATION: Better identify CAREER proposals in the eJacket system for future COVs. | |
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br>Comments: NONE | YES |
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br><br>Comments: The COV was unable to identify the success rate for proposals from different institutional types. The PAC report specified the number funded from each institution type but not the number of proposals, and the COV was not able to search the eJacket by Institution Type to look at individual proposals.<br><br>RECOMMENDATION : Better identify success rates by institutional types. | YES |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br><br>Comments: The COV noted that virtually all proposals integrated research and education, if by education what is meant is graduate training. In one of the larger discussion groups, we discussed the growing reluctance of PIs to support graduate students because of the very large expense. The costs have escalated dramatically: At some schools a graduate student can cost more than a postdoc, and gives less return in terms of the research achieved. We continue to feel that graduate education is a very important component of NSF's mission. One proposal that was made was to shift the NSF Fellowship funding to the last three years of the graduate program instead of the first three. This would make the selection process much more effective since far more would be known about the students and they could write their own proposals. Most of those who drop out would be gone by the time the proposals are considered. In the first two years those who are supported on RO1 grants would be apprentices, learning the tools that they need to be effective at the dissertation level. Also, at this stage they are more likely to be working directly towards the goals specified in the RO1 proposal.<br>It may be worth pointing out that directly supporting the students on Graduate Fellowships is cost-effective for NSF relative to paying them as RAs on a grant, since no indirect costs are charged (or so we believe). This might allow the number to be increased. | YES |

| | |
|---|---|
| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities?<br><br>Comments: The COV noted an appropriate balance across disciplines and sub-disciplines, as indicated by the number of proposals submitted to other panels that were co-reviewed by PAC. | YES |
| 11. Does the program portfolio have appropriate participation of underrepresented groups?<br>Comments: | Data not available |
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br><br>Comments: The COV found that all of the proposals were relevant to the first arm of the agency's mission ("to promote the progress of science"), the results derived from many would most likely be relevant to the second arm of the agency's mission ("to advance the national prosperity and welfare"), but none were specifically relevant to the third arm of the agency's mission ("to secure the national defense").<br><br>All proposals were relevant to the national priority of maintaining leadership in science and to facilitating an influx of talented scientists and engineers, | |
| 13. Additional comments on the quality of the projects or the balance of the portfolio: | |

**A.5 Management of the program under review**. Please comment on:

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|---|
| 1. Management of the program.<br><br>Comments: The COV commends the directorate for securing recent Program Officers who share great enthusiasm for the program, who have made great efforts to improve the program, and who have identified leading edge areas of focus. |
| 2. Responsiveness of the program to emerging research and education opportunities.<br><br>Comments: The COV finds the program highly responsive to emerging research and educational opportunities as reflected in PAC's participation in NSF Priority Areas, such as Human Social |

Dynamics, and SBE-Initiatives, such as Science Metrics. Furthermore the name change from Human Perception and Cognition to Perception, Action and Cognition in the past couple of years reflects responsiveness to the emerging importance of research on action, and helps to distinguish the program's purview from that of other programs, such as Cognitive Neuroscience.

3.Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments: The COV was not given any information about program planning or the prioritization process that guided the development of the portfolio.

4.Additional comments on program management:

The COV recognized the great need for additional senior staff and was delighted to learn that a co-director for PAC would soon be hired. Additional support staff is critical (e.g., additional support staff could reduce the dwell time by handling the paper work for declines). The current staff perform valiantly in the face of an overwhelming workload.

The current ratio of "rotators" to permanent staff is too high, although this may be a temporary stage. If it were maintained, the COV highly recommends that greater overlap between successive rotators' tenure be arranged.

## PART B. RESULTS OF NSF INVESTMENTS

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a

credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business proposal; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

**B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.**

**B.1 OUTCOME GOAL for PEOPLE: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

The following proposal awarded by PAC illustrates this goal.

Gray, Proposal # 0239657, Arizona State University. This project integrates research and education to investigate how people use perceptual and cognitive information to avoid or create a collision with an approaching object. Gray combines theoretically motivated basic research with real world situations such as driving and baseball, in the context of virtual environments. This three-way combination provides an opportunity to develop highly engaging (or, in plain English, really cool) materials for classroom education at graduate and undergraduate levels but also in the context of secondary (and, potentially, even primary) education.

**B.2 OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."**

The following proposal awarded by PAC illustrates this goal.

Cleary, Proposal # 0349088, Iowa State University. This project uses the Classroom Performance System to involve undergraduates in research demonstrations, in testing hypotheses and in taking part in active research program of the instructor. The project uses a wireless remote keypad for responses which are then rapidly pooled, analyzed by computer, and the results displayed on a screen for discussion.

**B.3 OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

The following proposal awarded by PAC illustrates this goal.

Roy, Proposal # 0554772, MIT. The work is notable because Roy and his colleagues are gathering an unprecedented amount of multimodal data, with unprecedented detail, on child language development. The technologies available and their use in this project are highly novel as technologies relevant to language research and (therefore) enable highly novel methodological approaches to the study of language acquisition. For the first time, we can have a *complete*, *objective* record of how language develops outside the laboratory. This will permit a microgenetic approach to language acquisition that simply has not been possible prior to the advent of these tools. The tools used in this project will become broadly accessible (e.g., they are less costly than an MRI machine), and can be used in the study of many behaviors beyond language acquisition.

Another example is Heller, Proposal # 0446955, Brown University. The goal of this research is to

develop a taxonomy, a database and a characterization of natural sounds, described in terms of the action and the material, comparable to studies of object perception in vision. The research may have practical proposals in the enhancement of auditory displays, both for virtual reality and for visually impaired computer users, as well as providing a new model for the development of automatic sound recognition systems.

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[50]**

## PART C. OTHER TOPICS

**C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.**

RECOMMENDATION**:** One area that is growing rapidly and generating exciting ideas and findings is emotion. At present proposals involving studies of emotion are distributed to different panels as appropriate. However the COV see an advantage to making explicit the fact that this is an area of interest to be funded by NSF. One option might be that the PAC panel be expanded to PACE with the goal of attracting good proposals that center on this area.

**C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.**

The PAC program has been very successful in facilitating transformative research, by incorporating into its portfolio an area of research that is leading edge and innovative. This area, movement studies (as exemplified by the study of action and the study of embodied cognition), has clearly "found its home" in the PAC program. It was through the insight and foresight of the former Program Officer and the current Program Officer that this transformative research area has been established and nurtured within PAC.

**C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.**

The COV feels that the current structure of focusing on single-PI awards may not reflect the increasing tendency for research to be conducted by collaborative teams (often spread out over several institutions). Some NSF programs or initiatives reflect this interdependence (e.g., HSD requires group proposals), but the COV suggests that greater emphasis is needed. The COV recommends implementing a mechanism within ongoing program areas by which proposals may be submitted by groups of investigators working together on a single project (just as happens when several researchers co-author individual articles). This would not be the same as Center grants. It would fund research just as current regular NSF awards do; the principal change would be to permit multiple, co-equal PIs. One option might be for each program to stipulate that some percentage of its budget be set aside for these collaborative, interdependent proposals (e.g., 25%). One benefit of this approach is that it would encourage and facilitate

[50] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

interdisciplinary research, since PIs on group proposals would not necessarily all be from the same field.

With additional staff, it would be important to direct some attention toward outreach toward minority and underrepresented groups to encourage greater participation among minority and underrepresented groups as PIs, students, and postdocs. Along with this emphasis it will be increasingly important to collect more exact and specific data on the participation of minority and underrepresented groups in all aspects of the PAC review and research process.

**C.4 Please provide comments on any other issues the COV feels are relevant.**

The current panel on cognitive neuroscience was created (as we understand it) to advance methods in this field. We understand that this may have been appropriate over a short term as the techniques themselves were a primary focus of research development. However, we are wary of maintaining, over the long term, any program area that is focused on methods. We RECOMMEND that NSF consider, in the near future, creating a program area that is focused on neuroscience, per se (that is, research that is focused directly and primarily on the brain and neural function, rather than on behavior). Beyond this, proposals that include neuroscience techniques in broader studies of behavior should be reviewed and funded by relevant program areas. For example, proposals for research on cognition, perception, or action that included a neuroscience component would be assigned to PAC, while proposals for research on social psychology that included a neuroscience component would be assigned to social program areas.

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

The COV would benefit from greater direction in advance on what to look for among the proposals and their peripheral materials prior to arriving on site for the COV meeting. Although much of the relevant material was available, it took us a while to discover it, or in some cases we missed it altogether. For example, if COV members first viewed a proposal without a progress report (because it was too recent), they might have assumed that none of the proposals were accompanied by progress reports. As a second example, it would have been helpful for the COV to be told explicitly to check the revised budgets, which are usually different from the proposed budgets. On the other hand, the COV did not need to see the Review Analyses unless they were distinct from the Panel Summaries. Perhaps only the ones that differed could be included.

**SIGNATURE BLOCK:**
Morton Ann Gernsbacher
Thomas Stoffregen
Anne Treisman

_____
For the 2006 BCS COV

# Physical Anthropology

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| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: PHYSICAL ANTHROPOLOGY** |
| **Division: BCS** |
| **Directorate: SBE** |

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

### A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[51] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br><br>Comments: The review mechanism for senior grants, involving both panel and ad hoc reviews, is appropriate. We are unaware of site visits | Yes |
| 2. Is the review process efficient and effective?<br>Comments:<br><br>We noted that the revise and resubmit recommendation aided PIs in improving their science. With respect to efficiency, 37% return on reviews seems low, but this rate seems to be fairly typical. We are also pleased that new faculty are included as reviewers. | Yes |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?<br><br>Comments: Reviews, whether positive or negative, were sufficiently extensive to | Yes |

[51] If "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| provide guidance for the PI and Program Director.<br><br>As an aside to the Program Director: In the case of a positive review where the reviewer can suggest additional questions, approaches, or methods to supplement those in the proposal, is there a way for reviewers to do so without running the risk of jeopardizing the funding outcome? | |
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br><br>Comments: Panel summaries were sufficiently extensive. | Yes |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br><br>Comments: The recommendations accurately reflect the reviews and the panel summary. | Yes |
| 6. Is the time to decision appropriate?<br><br>Comments: No specific data bearing on this question were provided. Because the panels meet twice a year, the time from submission to panel is appropriate. Moreover, we note from the Program Director' s Overview of Program that the Program Director is frequently able to advise PIs of declined proposals of that decision in time for them to revise and resubmit for the subsequent panel. In anthropology this can be particularly important because of the seasonal nature of fieldwork opportunities. | Yes |
| 7. Additional comments on the quality and effectiveness of the program's use of merit review procedures: | |

## A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[52] |
|---|---|
| 1. Have the individual reviews (either mail or panel) addressed both merit review criteria?<br><br>Comments: In general, reviews addressed both merit criteria, but in almost all cases emphasis was placed on intellectual merit. Reviewer comments on broader impacts sometimes inappropriately included comments on intellectual merit rather than what NSF considers broader impacts. | Yes |
| 2. Have the panel summaries addressed both merit review criteria?<br><br>Comments: Panel summaries did a good job of addressing both merit criteria. | Yes |
| 3. Have the *review analyses* (Form 7s) addressed both merit review criteria?<br><br>Comments: Review analyses did a good job of addressing both merit criteria. In at least one case, the strong broader impact of a proposal led to the Program Director selecting it from among similarly ranked proposals. | Yes |
| 4. Additional comments with respect to implementation of NSF's merit review criteria: | |

[52] In "Not Applicable" please explain why in the "Comments" section.

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| SELECTION OF REVIEWERS | YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[53] |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br>Comments: | Yes |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br><br>Comments: In addition we are pleased to note that in cases where the research involved multiple, different research methods, multiple experts provided reviews. | Yes |
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[54]<br>Comments: | Data not Available |
| 4. Did the program recognize and resolve conflicts of interest when appropriate?<br><br>Comments: In the proposals that we reviewed we found two instances where current collaboration on a manuscript was not reported as a conflict of interest and one instance where a review that reported a conflict (a doctoral advisee) was released. | Not Always |
| 5. Additional comments on reviewer selection:<br><br>We appreciate the diligence of the Program Director in identifying the large number of reviewers needed to review these proposals. | |

[53] If "Not Applicable" please explain why in the "Comments" section.

[54] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[55], OR DATA NOT AVAILABLE |
|---|---|
| 1. Overall quality of the research and/or education projects supported by the program.<br><br>Comments: Based on the sample of 89 proposals from this program made available to the COV and our reading of a substantial portion of them, the physical anthropology program has supported research of very high quality. | Appropriate |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br><br>Comments: Many of the grants we examined had budgets significantly reduced from the original request. The funding appeared to be adequate for the reduced scope of the projects. In many cases we feel the budget reduction was wise management of NSF funds, however, in other cases it may be indicative of the apparent under-funding of the physical anthropology program, especially with regard to larger projects. | Appropriate (but see comments) |
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[56]<br><br>Comments: We found a number of methodologically innovative proposals, innovative applications of existing techniques, and some high risk proposals. | Appropriate |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br><br>Comments: Physical anthropology is inherently multidisciplinary, so almost all projects are multidisciplinary. | Appropriate |
| 5. Does the program portfolio have an appropriate balance of:<br>• Funding for centers, groups and awards to individuals? | Appropriate |

[55] If "Not Appropriate" please explain why in the "Comments" section.

[56] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

| | |
|---|---|
| Comments: The physical anthropology program funded several collaborative projects. In addition, the funding initiatives in the HOMINID program are all large-scale collaborative projects. We are not aware of any funding for centers. | |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators?<br><br>Comments: We are somewhat unclear on the exact definition of new investigator. From the information provided to us, there were a substantial number of awards to assistant professors (an average of 8 senior awards per year to assistant professors as compared to an average of about 11 awards per year to more senior investigators). With respect to dissertation awards, an average of 6.3 awards per year went to assistant professors compared to 23 awards per year to more senior investigators. We don't know if this means that junior faculty's dissertation proposals are not being funded or that junior faculty do not yet have doctoral students. | Appropriate |
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br>Comments: | Appropriate |
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br><br>Comments: Over 75% of awards go to research intensive PhD institutions. This seems in line with expectations. | Appropriate |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br><br>Comments: Almost all proposals indicate that they will involve and train students. The program funds approximately 25 dissertation improvement grants every year. The program has recently gone to a panel with fixed deadlines for the review of dissertation awards, and at about the same time there was a doubling of the number of applications. We are concerned about the decline in success rate for dissertation applications. We realize that an increase in funding for dissertation proposals would likely mean a decrease in funding for senior proposals, but believe that nurturing the next generation of scientists is vital. We suggest that the budget for dissertation proposals be increased to 1.5. to 2.0 times the current level. | Appropriate |
| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities? | Not Appropriate |

| | |
|---|---|
| Comments: Using our own six categories to classify applications and awards, we found that one important subdiscipline, human biology, was substantially underrepresented in terms of both submissions and awards. By way of illustration, the sample of 39 senior proposals provided to us contained only 3 proposals that we classified as human biology and none was among the 19 funded. It is not clear whether the difference between our analysis and that of the Program Director relates to sampling in addition to the clear difference in how the subdisciplines are defined. We encourage the Program Director's concept of making presentations designed to explain and encourage proposal submission at meetings of organizations such as the Human Biology Association. Using our revised categorization, which included an additional category for bioarchaeology proposals, we found that subdiscipline to be heavily represented at all levels. We were thus pleased to learn that a representative of this subdiscipline has been added to the senior panel. | |
| 11. Does the program portfolio have appropriate participation of underrepresented groups?<br><br>Comments: To quote the report, "While over 50% of the membership of the AAPA [American Association of Physical Anthropologists] is female, and over 70% of the students are female, only 1/3 of the proposals have come from female PIs. Once proposals are submitted, there is no disparity in funding." We do not understand why female PIs submit proposals at a lower rate. Workshops such as those mentioned in number 10 might be useful, as might a serious study of this phenomenon, perhaps across the division, directorate or Foundation.<br><br>There are few submissions from minorities. In large part this reflects the composition of the profession. | Not Appropriate |
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br>Comments: | Appropriate |
| 13. Additional comments on the quality of the projects or the balance of the portfolio: | |

**A.5 Management of the program under review**. Please comment on:

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|---|
| 1. Management of the program.<br><br>Comments: The Physical Anthropology program is extremely well managed. As noted earlier, the resources seem carefully allocated, the documentation for award recommendations are fair and thorough, differences of opinions among reviewers were clearly mediated, and PIs were asked to provide additional information when necessary to facilitate the decision making process. The Program Director is very available to consult with members of the scientific community. |
| 2. Responsiveness of the program to emerging research and education opportunities.<br><br>Comments: The Physical Anthropology program was actively involved in the creation of the HOMINID and Human and Social Dynamics programs. The Program Director is active in alerting the physical anthropology community about new funding opportunities, both within the physical anthropology program and within NSF in general. |
| 3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.<br><br>Comments: The Program Director works to keep a balance of awards to different subdisciplines and between senior and dissertation awards. |
| 4. Additional comments on program management:<br><br>We note the very heavy workload of the Program Director and urge allocation of a Science Assistant, perhaps to be shared among the three anthropology programs. |

## PART B. RESULTS OF NSF INVESTMENTS

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in

research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

**B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.**

**B.1 OUTCOME GOAL for PEOPLE: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

Comments: The program makes a substantial commitment to funding doctoral dissertation research, i.e. training the next generation of our STE workforce.

A major focus of physical anthropology research is international, and the portfolio includes many projects that work to create a globally engaged workforce. Almost every nugget describes a project that has an international component in terms of data collection and/or collaboration with international scientists or students in all corners of the globe: David Tracer ("Is Crawling Universal?" [New Guinea]), University of Colorado at Denver, #9896324; Juan Martinez ("Ethnic Contributions to the Puerto Rican Mitochondrial Gene Pool"), University of Puerto Rico at Mayaguez, #9904252; Chris Beard ("Investigating the Origin and Early Evolution of Primates in Asia"), Carnegie Musuem of Natural History, # 0309800; Thomas McDade ("Acculturation and Health in a Bolivian Amerindian Population), Northwestern, #0134225; ("Is Habitat Change a Cause of Demographic Collapse for Sifakas?"[Madagascar]), Patricia Wright, Stony Brook, #0333078.

**B.2 OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."**

Comments: Each of the various subdisciplines of physical anthropology provides opportunities for discoveries at the frontier of science, often linked to educational or service related activities. For example and in addition to those cited above, in paleoanthropology. Examples include F. Clark Howell and Tim White, "Revealing Hominid Origins", University of California at Berkeley, #0321893 HOMINID); and Brenda Benefit, "Paleoanthropological Investigation...in Eastern Libya", New Mexico State, #0515591. With respect to living primates two projects combining discovery and learning are Jeanne Altman and Susan Alberts, "Life in a Changing Environment," Princeton and Duke, #0323596, 0323553 (HOMINID); and Colin Chapman, "Predictors of Colobus Abundance",

University of Florida, #0342582. Notable projects in morphology include Susan Larson, "Experimental Studies on Primate Locomotion," Stony Brook, #0411489; and Dan Lieberman, "Head Stabilization in Running," Harvard, #0443994. Interesting bioarchaeology projects include Lori Wright, "Dental Analysis of Maya Population Variability, Texas A & M, #0234006; and Clark Larsen, "Dissertation: Bioarcheological Perspective on Behavior, Activity, and Lifestyle in the Eastern Woodland of North America," Ohio State University, #0424246. " Two genetics proposals that fit this category are Ripan Malhi, "Genetic Diversity in the American Southwest and Mesoamerica," University of California at Davis, #0422144; and Ken Weiss, "Making Waves: From Pattern to Structure in Dental Evolution," #0343442. Finally, in human biology Michelle Lampl, Dissertation: A Longitudinal Study of Infant Growth and Development," Emory, #04243076; and Kim Hill, "Dissertation: Skill Investment and Resource Acquisition among the Maku," University of New Mexico, #0206885.

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**B.3 OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

Comments: Several funded projects are working toward creating publicly accessible databases: Jeanne Altman and Susan Alberts, "Life in a Changing Environment," Princeton and Duke, #0323596, 0323553 (HOMINID); Michael Hammer and Jeffrey Wall, "A Novel Genetic Database for Testing Models of Human Origins," University of Arizona and Southern California, #0423123, 0423670. Some scientists are developing new techniques and tools for data collection and analysis. These include Peter Ungar and Christopher Brown, "3-D Analysis of Dental Microwear," University of Arkansas and Worchester Polytechnic Institute, "0315157, 0315194; Thomas McDade, "Acculturation and Health in a Bolivian Amerindian Population, Northwestern, #0134225; and Michelle Lampl, Dissertation: A Longitudinal Study of Infant Growth and Development," Emory, #04243076; Susan Williams, "Jaw-Muscle Electromyography During Chewing in Costa Rican Monkeys ", Ohio University, #0507074.

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[57]**

Comments: The program has clearly spent what limited funds it had well and is clearly capable of effectively utilizing increasing resources as they become available. The labor saving efficiency of Fastlane facilitates the Program Director spending more time on developing and supporting good science.

[57] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

## PART C. OTHER TOPICS

**C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.**

Covered in section A4-10, 11.

**C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.**

Not applicable.

**C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.**

See above – provide more money for science assistants for Program Director and for dissertation support.

**C.4 Please provide comments on any other issues the COV feels are relevant.**

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

We found many of the questions to be unclearly worded (A1-2, section A4 [especially question 12], B2) – perhaps some of the questionnaire experts at NSF could work on improving the questions. It was hard to determine the meaning of terms such as efficient and appropriate without some guidelines).

The information provided was not always tailored to the questions. For example, it would have been useful to have had access to all the funded proposals prior to the COV meeting; the program statistics on PI demographics were not in a format for answering the questions.

Ejacket is unnecessarily cumbersome – access to proposal segments was satisfactory, however accessing the subsidiary documents (e.g. reviews, Form 7) required not only multiple cycling through the drop down menu but in some cases multiple mouse clicking to obtain the document in the correct format.
**Recommendation**: Make all subsidiary documents available with a single button, in the same way as the proposal.

The second day breakout sessions were interesting, but require much stronger focus and leadership.
**Recommendation**: Assign a senior NSF staff member to lead discussion and provide guidelines for group.

**SIGNATURE BLOCK:**
Cynthia Beall
Eric Delson
Sara Stinson

_____
For the 2006 BCS COV

# Social Psychology

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| **Date of COV: March 23 & 24, 2006** |
| **Program/Cluster/Section: SOCIAL PSYCHOLOGY** |
| **Division: BCS** |
| **Directorate: SBE** |

## PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

Briefly discuss and provide comments for *each* relevant aspect of the program's review process and management. Comments should be based on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. Provide comments for *each* program being reviewed and for those questions that are relevant to the program under review. Quantitative information may be required for some questions. Constructive comments noting areas in need of improvement are encouraged.

### A.1 Questions about the quality and effectiveness of the program's use of merit review procedures.

Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

| QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[58] |
|---|---|
| 1. Is the review mechanism appropriate? (panels, ad hoc reviews, site visits)<br><br>Comments: It would be helpful, however, to have more information on how the panel uses the ad-hoc reviews and if they are submitted in time for panel discussion. | Yes |
| 2. Is the review process efficient and effective?<br><br>Comments: The two PO system appears to have helped the program. Reviews take less time (M=5.7 months compared to 9.92 in FY03) and now include more reviews (M=4.76 compared to 3.32 in FY03). Given the expected increase in proposals, the two PO system should be maintained and additional support staff provided as needed. | Yes |
| 3. Do the individual reviews (either mail or panel) provide sufficient information for the principal investigator(s) to understand the basis for the reviewer's recommendation?<br><br>Comments: The reviews were very constructive and detailed. | Yes |

[58] If "Not Applicable" please explain why in the "Comments" section.

| | |
|---|---|
| 4. Do the panel summaries provide sufficient information for the principal investigator(s) to understand the basis for the panel recommendation?<br><br>Comments:<br>The panel summaries provide very little information, broader impacts are rarely discussed, and funded proposals appear to garner little enthusiasm. Thus, it is hard to differentiate funded from non-funded proposals by the tenor and text of the summaries. | No. |
| 5. Is the documentation for recommendations complete, and does the program officer provide sufficient information and justification for her/his recommendation?<br><br>Comments: The review analysis is a helpful addition to the process and conveys very well both the scientific merit and the broader impact implications of proposals. | Yes |
| 6. Is the time to decision appropriate?<br><br>Comments: As previously stated, the use of two POs has helped tremendously. Adequate time to decision (within 6 mos.) has increased from 14% (FY03) to 70% (FY05). However, it would appear that there is a structural problem with the reviews from the Fall panel not getting to PI's in sufficient time to resubmit for the January deadline. The Fall panel meets later in relation to the submission deadline than the Spring panel. | Yes |
| 7. Additional comments on the quality and effectiveness of the program's use of merit review procedures:<br><br>The merit review process is effective and it is commendable that the POs emphasize to the panel the need to pay special attention to the potential of innovative proposals that necessarily entail risk and are by less established early career scientists. | |

## A.2 Questions concerning the implementation of the NSF Merit Review Criteria (intellectual merit and broader impacts) by reviewers and program officers.

Provide comments in the space below the question. Discuss issues or concerns in the space provided.

| IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA | YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[59] |
|---|---|
| 1. Have the individual reviews (either mail or panel) addressed both merit review criteria?<br><br>Comments: The reviewers do not consistently address the broader impact of the work. Further, many broader impact statements relied solely on student training or similar otherwise expected behaviors. It would be valuable to provide specific examples for PI's (e.g., partnerships with minority serving institutions, presentations of work to elementary schools, collaboration with minority PI's). It would also be important to ensure that all involved in the review process were clear about the role that broad impact statements played in funding decisions. | No. |
| 2. Have the panel summaries addressed both merit review criteria?<br><br>Comments: The panel summaries do not consistently address the broader impact. Often, the best justification of a broader impact was presented by the PO (relative to the PI and the reviewers). | No. |
| 3. Have the *review analyses* (Form 7s) addressed both merit review criteria?<br><br>Comments: The PO generally addresses both review criteria. | Yes |
| 4. Additional comments with respect to implementation of NSF's merit review criteria:<br><br>It would be appropriate to provide standardized training on 'broader impact' for PO's, panel members, and outside reviewers. Articulating relevant examples to PI's is also warranted. | |

[59] In "Not Applicable" please explain why in the "Comments" section.

**A.3 Questions concerning the selection of reviewers.** Provide comments in the space below the question. Discuss areas of concern in the space provided.

| SELECTION OF REVIEWERS | YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[60] |
|---|---|
| 1. Did the program make use of an adequate number of reviewers?<br><br>Comments:<br>The panel now uses 4.76 reviewers/proposal, which adds confidence to the outcome. | Yes |
| 2. Did the program make use of reviewers having appropriate expertise and/or qualifications?<br><br>Comments: Based on the information available to use, this seemed perfectly appropriate. | Yes. |
| 3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?[61]<br><br>Comments: This information was not readily accessible and had to be inferred. In addition to these variables, however, reviewer experience should be considered. It seems desirable to include younger investigators in the process, but to also have a more experienced perspective on the research. | Not available. |
| 4. Did the program recognize and resolve conflicts of interest when appropriate?<br>Comments: | Not available. |
| 5. Additional comments on reviewer selection:<br><br>There was no information given regarding COI or any resolutions achieved. | |

[60] If "Not Applicable" please explain why in the "Comments" section.

[61] Please note that less than 35 percent of reviewers report their demographics last fiscal year, so the data may be limited.

**A.4 Questions concerning the resulting portfolio of awards under review**. Provide comments in the space below the question. Discuss areas of concern in the space provided.

| RESULTING PORTFOLIO OF AWARDS | APPROPRIATE, NOT APPROPRIATE[62], OR DATA NOT AVAILABLE |
|---|---|
| 1. Overall quality of the research and/or education projects supported by the program.<br><br>Comments: We are impressed by the high quality of funded projects. We are also dismayed at the large number of proposals recommended for funding that did not get funded. It appears that 56% of recommended proposals were left unfunded (for 04 and 05). It is unclear what message this gives to the PI. | Yes. |
| 2. Are awards appropriate in size and duration for the scope of the projects?<br><br>Comments: The trend towards longer more expensive projects means fewer research proposals are getting funded. | No. |
| 3. Does the program portfolio have an appropriate balance of:<br>• Innovative/high-risk projects?[63]<br><br>Comments: This is hard to quantify. The trend towards larger projects seems to predict fewer high risk and truly innovative projects by younger PIs. One mechanisms used by the Social Psychology Program to foster more risky research is to provide relatively small amounts of seed funding especially to early career investigators to whom awards in the range of $30,000 can make a huge difference. This mechanism might be formalized. | No. |
| 4. Does the program portfolio have an appropriate balance of:<br>• Multidisciplinary projects?<br><br>Comments: The program appears to have a number of co-funded projects, and within the program solely funded portfolio are a number of multidisciplinary awards. This is commendable and illustrates the value of pursuing opportunities for multidisciplinary funding. | Yes |
| 5. Does the program portfolio have an appropriate balance of: | Yes. |

[62] If "Not Appropriate" please explain why in the "Comments" section.

[63] For examples and concepts of high risk and innovation, please see Appendix III, p. 66 of the Report of the Advisory Committee for GPRA Performance Assessment, available at <www.nsf.gov/about/performance/acgpa/reports.jsp>.

| | |
|---|---|
| • Funding for centers, groups and awards to individuals?<br>Comments: The focus is on individual research awards, and given the current unfavorable situation for social psychological research, this seems appropriate. | |
| 6. Does the program portfolio have an appropriate balance of:<br>• Awards to new investigators?<br><br>Comments: As far as we can tell, there appears to be fewer young PIs getting awards in 2005. More specific data should be provided by years since earning PhD. to award. | No. |
| 7. Does the program portfolio have an appropriate balance of:<br>• Geographical distribution of Principal Investigators?<br><br>Comments: It appears appropriate, with PI's in EPSCoR states earning awards as well. | Yes. |
| 8. Does the program portfolio have an appropriate balance of:<br>• Institutional types?<br><br>Comments:<br>There is a good mix of proposals from the various institution types with an obvious preponderance from the research-intensive universities. Just as importantly, the award rates mirror the proposal rates. | Yes. |
| 9. Does the program portfolio have an appropriate balance of:<br>• Projects that integrate research and education?<br><br>Comments: Research and education are by definition integrated. Research involves student participation at all levels. | Yes. |
| 10. Does the program portfolio have an appropriate balance:<br>• Across disciplines and subdisciplines of the activity and of emerging opportunities?<br><br>Comments: The portfolio appears diverse. It seems important, however, for the program officers to identify new types of outreach to further identify emerging areas of research. One option is to also attend non mainstream conferences beyond SPSP to identify new areas and outreach to new audiences. | Yes. |
| 11. Does the program portfolio have appropriate participation of underrepresented groups? | No. |

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| Comments: In 2005, there were zero African-Americans, Latinos, Asians, or Native-Americans funded. Across the previous 2 years, only 6 such proposals were funded. This pattern reflects a dearth of minority proposals. The rates of funding are similar, but the raw numbers of submitted proposals are low. Further efforts should be made to identify more minority PIs as well as ad-hoc reviewers and panel members. Given that social psychology is one of the areas of science that attracts a reasonable number of Ph.D. students from underrepresented groups many of whom are funded by NSF, it would appear to be of critical importance to support the research of early career scientists from underrepresented groups. | |
| 12. Is the program relevant to national priorities, agency mission, relevant fields and other customer needs? Include citations of relevant external reports.<br><br>Comments: The program has made consistent efforts to respond to important national concerns such as responses to 9/11, terrorism, emergency responses (e.g., Katrina) in addition to the basic goals of social psychology. | Yes. |
| 13. Additional comments on the quality of the projects or the balance of the portfolio: | |

**A.5 Management of the program under review**. Please comment on:

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|---|
| 1. Management of the program.<br><br>Comments: The system of one permanent program officer and one rotator appears to work well. The number of reviewers/proposal has increased, and the dwell time has been significantly reduced. Over 70% of proposals are completed within 6 months in the last cycle, in comparison to 14% in FY03. In addition, the ad-hoc review system seems to work well. |
| 2. Responsiveness of the program to emerging research and education opportunities.<br><br>Comments: The program appears to have responded well to recent NIMH changes in priorities and they took this as an opportunity to fund more basic social psychological research. However, the reduction in funding allocated for basic social-psychological research at NIMH does not appear to have resulted in a commensurate increase in funding available for basic social psychological research at NSF. |
| 3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.<br><br>Comments: The program appears to have moved to larger projects over more years, but that plan |

was never fully described. Similarly, the move to fund more PIs in response to NIMH seems appropriate.

4. Additional comments on program management:

**PART B. RESULTS OF NSF INVESTMENTS**

NSF investments produce results that appear over time. The answers to the first three (People, Ideas and Tools) questions in this section are to be based on the COV's study of award results, which are direct and indirect accomplishments of projects supported by the program. These projects may be currently active or closed out during the previous three fiscal years. The COV review may also include consideration of significant impacts and advances that have developed since the previous COV review and are demonstrably linked to NSF investments, regardless of when the investments were made. Incremental progress made on results reported in prior fiscal years may also be considered.

The following questions are developed using the NSF outcome goals in the NSF Strategic Plan. The COV should look carefully at and comment on (1) noteworthy achievements of the year based on NSF awards; (2) the ways in which funded projects have collectively affected progress toward NSF's mission and strategic outcomes; and (3) expectations for future performance based on the current set of awards. NSF asks the COV to provide comments on the degree to which past investments in research and education have contributed to NSF's progress towards its annual strategic outcome goals and to its mission:

- To promote the progress of science.
- To advance national health, prosperity, and welfare.
- To secure the national defense.
- And for other purposes.

Excellence in managing NSF underpins all of the agency's activities. For the response to the Outcome Goal for Organizational Excellence, the COV should comment, where appropriate, on NSF providing an agile, innovative organization. Critical indicators in this area include (1) operation of a credible, efficient merit review system; (2) utilizing and sustaining broad access to new and emerging technologies for business application; (3) developing a diverse, capable, motivated staff that operates with efficiency and integrity; and (4) developing and using performance assessment tools and measures to provide an environment of continuous improvement in NSF's intellectual investments as well as its management effectiveness.

## B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes (nuggets) as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

**B.1 <u>OUTCOME GOAL for PEOPLE</u>: Developing "a diverse, competitive and globally engaged workforce of scientists, engineers, technologists and well-prepared citizens."**

Comments: The social psychology program has been critical in fulfilling the NSF mission in this regard. Women entail ½ of our nation's workforce, and social psychology has been critical in

addressing impediments to our full utilization of women in the workforce. For instance, social psychology funds research that addresses female performance in math achievement (PI Good; PI Josephs), negative reactions to powerful women (PI Rudman), restrictions to women in the workforce (PI Rudman), and a number of other relevant proposals. Social psychology also funds a number of projects with direct relevance to how we interact on a global scale. A number of funded projects investigate how cultures interact in judgment (PI Nisbett), culture and social support (PI Taylor), and a number of other relevant studies. In short, the social psychology mission directly supports this outcome at all levels.

Finally, social psychology supports the summer institute which trains over 70 students/summer in modern research technologies. This is a prime example of NSF's investment in people through support for programs that enhance education and diversity. Similarly, the advanced training institutes provide extensive training in internet data collection, virtual reality, and the social relations model. Each program has been a huge success.

**B.2 OUTCOME GOAL for IDEAS: Enabling "discovery across the frontier of science and engineering, connected to learning, innovation, and service to society."**

Comments: Social psychology is by nature interdisciplinary. This research promotes discoveries across multiple boundaries. For instance, social psychology provides funding for neuropsychological initiatives (PI Ochsner), facial reactions to emotion (PI Prentice), reducing racist attitudes in children (PI Levy), perception and social influences on perception (PI Clore).

**B.3 OUTCOME GOAL for TOOLS: Providing "broadly accessible, state-of-the-art S&E facilities, tools and other infrastructure that enable discovery, learning and innovation."**

Comments: Immersive virtual environment technology, internet technology to conduct social and behavioral science research, and the social relations model are all new state-of-the-art tools that are funded by the social psychology program. Each tool will be important in the development of science beyond social psychology.

**B.4 OUTCOME GOAL for ORGANIZATIONAL EXCELLENCE: Providing "an agile, innovative organization that fulfills its mission through leadership in state-of-the-art business practices."[64]**

Comments: NSF is excellent in involving active scientists in its leadership and in running the various programs. The rotation system is excellent in infusing new ideas and energy on a continuous basis. Organizational excellence can be also be improved by the continued combination of a permanent program officer with a rotator.

[64] For examples and further detail on the Organizational Excellence Goal, please refer to pp. 19-21 of NSF's Strategic Plan, FY 2003-2008, at <http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf04201>.

## PART C. OTHER TOPICS

**C.1 Please comment on any program areas in need of improvement or gaps (if any) within program areas.**

1. The recent changes at NIMH regarding funding for social psychology have not been reflected in current budgets at NSF. The program is tackling the task of funding research that was previously funded by two agencies. Concerns over funding are having a chilling effect at all levels and is hurting the field via its impact on tenure decisions for young investigators. Graduate training is suffering and undergraduate students are opting for more secure futures than those offered by doctorate in psychology and related sciences.
2. Ethnic diversity appears to be a problem. The underrepresentation appears at the panel stage and at the PI stage. Remedies are suggested throughout.
3. The move towards larger grants might be reducing new investigator funding. This might also be reducing innovative research.

**C.2 Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.**

**C.3 Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.**

The dual program officer approach (one permanent and one rotator) appears to work very well. The review process has been dramatically improved accordingly.

Under-representation of ethnic minorities appears to be an issue that requires a broad and systematic solution.

**C.4 Please provide comments on any other issues the COV feels are relevant.**

It is unclear why the social psychology program has to support the American Academy of Sciences. The program is not unique to social psychology and it seems to us that is should be an initiative wide funded program.

**C.5 NSF would appreciate your comments on how to improve the COV review process, format and report template.**

It would be very helpful if all the materials were in one clickable link. As is, we have to download the proposal, then the reviews, then the summary statement, then the review analysis. It would be a tremendous help if this was all in one file.

It would have been helpful to have more information regarding proposals that received a revise and resubmit. This will help with tracking the process and to identify how various demographics influence the revision process. This will provide a better sense of how many grants are ultimately funded.

## COV Report Supplemental Questions for the Division of Behavioral & Cognitive Sciences Social Psychology Program

1. **The role of social developmental psychology in the social psychology program has understandably lessened with the creation of the Developmental and Learning Sciences program. However the focus on social developmental research remains in the program solicitation. Should that reference be completely eliminated, understanding that social psychology would still continue to support social developmental research through co-funding with the DLS program?**

   Funding for social developmental research in the social psychology program dropped considerably in the last two budget years (8.1% in FY04; 9.1% in FY05); coupled with the creation of the DLS program, this pattern is consistent with a move to eliminate social developmental as a focus in the program solicitation. Doing so would also reduce the need to have two developmental experts on the panel, and the associated costs.

2. **The program, on the advice of the advisory panel, has reduced the amount of support it gives to workshops and training institutes. What is the COV's opinion about the role of workshops, conferences, and training institutes in the overall portfolio of the program? Should the program specifically continue its support for the Summer Institute of Social Psychology that focuses on graduate training?**

   There should continue to be some flexibility provided to support workshops, conferences, and training institutes in the overall portfolio of the program. Review of these activities should be conducted in thoughtful manner so that the funded activities match the goals of NSF's social psychology program. The Summer Institute has been especially helpful in promoting networking among and inclusion of younger social psychologists in the field. Given consideration of the intellectual merit by the panel of future Institutes, we support continued funding for the Institute.

3. **Several programs in the SBE Directorate participate in a program called the Dissertation Improvement Award program, providing approximately $12,000 for dissertation research. The Social Psychology program has not participated in this program in the past because of the potential surge in proposal load. With two program directors, it may be possible to now participate in this program, although it is unknown how many proposals the program might expect. What is the COV's opinion on the advantages and disadvantages of participating in this award program?**

   The workload may make this unfeasible. This would presumably require two reviews of dissertation proposals, which would be time consuming. The associated funds might be better used as student support within existing grants or as minority supplements to existing grants.

4. **The Social Psychology program makes a concerted effort to promote broadened participation of underrepresented groups at all levels of the scientific endeavor. However, there is still room to improve the representation of these groups as PIs, reviewers, and panelists. Does the COV have any suggestions on what strategies the program might use to better reach underrepresented groups?**

a. One option is to enhance the outreach strategies to avenues with more minority representation. For instance, SACNAS is a great opportunity to reach large numbers of Chicanos and Native Americans. There is also a minority reception at SPSP that NSF can attend.
b. The broader impact statement given to reviewers and investigators can be strengthened to highlight minority participation at all levels. Just as importantly, the broader impact statements need to be enforced to the extent possible.
c. The COV believes that a critical time for minority scholars is in the early career stage. Efforts to solicit proposals, mentor the proposals, and integrate them into the NSF review system is an easy way to promote diversity without needing a formal NSF initiative.
d. There is a personal network of minority scholars, and simple networking can facilitate identifying new and upcoming scholars.
e. It would help if the Program officers were to highlight their efforts better to make those efforts more visible to minority scholars.
f. NSF can facilitate minority participation through travel awards for student presentations at SPSP and other conferences. One can even form partnerships with SPSP or other organizations to administer those programs.
g. Thematic conferences and workshops might prove particularly helpful.

**SIGNATURE BLOCK:**
Geraldine Downey
Delia Saenz
Michael Zarate

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For the 2006 BCS COV

Division of Behavioral and Cognitive Sciences
MEMORANDUM

Date: January 18, 2007

To: Office of the Assistant Director, SBE
Via: Division Director, BCS
From: Senior Science Assistant, BCS

Re: Demographics of the BCS COV

Attached you will find copies of the BCS COV report and the Division's response to their recommendations. Here is relevant information about the composition of the entire COV and procedures to resolve conflicts.

The BCS Division held its COV meetings in March 2006. The report contains the list of members for that COV. The COV for both of the division clusters had a total of 28 members, with the following demographic constitution:

*Gender:* 13 Male, 15 Female
*Geographic Distribution:* 10 Northeast, 5 Mid-Atlantic, 2 South, 5 Midwest, 6 West
*Minority Representation:* 3 African-American, 4 Hispanic
*Institutions:* 16 Public, 9 Private, 3 Federal
*Teaching:* 2 Undergraduate Institutions
*Recent NSF Awardees:* 14
*Number With No NSF Support in Past Five Years:* 14

Representative from the SBE Advisory Committee were present for each of the COV cluster meetings; both were women. Neither were minority members; one was from a public institutions, the other from a private institution – one in the mid-Atlantic, one in the midwest.

The introductory session at each meeting included a conflicts briefing and review of confidentiality requirements. None attending had pending proposals at the BCS programs being reviewed during the period of time they were appointed and completed their assignments for the COV. The procedure for random selection of declinations and awards to be reviewed set aside proposals on which COV members were principal investigators. The selection did include some proposals – awards and declinations - for which COV members were reviewers. These did not pose disqualifying COIs. The selection did include some proposals which posed institutional conflicts of interest for COV members; they did not review those proposals.

Kristin E. Küyük