

## **DIVISION OF BEHAVIORAL AND COGNITIVE SCIENCES PROGRAM RESPONSES TO THE 2006 COV REPORT**

### **Executive Summary**

A Committee of Visitors (COV) convened March 23-24, 2006 to review the disciplinary programs in the Division of Behavioral and Cognitive Sciences (Anthropological and Geographic Sciences cluster: Archaeology/ Archaeometry, Cultural Anthropology, Geography and Regional Science, and Physical Anthropology Programs, and the Psychological, and Language Sciences Cluster: Cognitive Neuroscience, Developmental and Learning Sciences, Linguistics, Perception, Action and Cognition, and Social Psychology Programs). In attendance for the COV were the 28 members, three members for each of the nine disciplinary programs and one COV chair, who met in plenary and in program-focused and cross-disciplinary sessions at different times of the meeting, as well as the current BCS Program Directors who joined the COV for selected portions of the meeting. SBE Assistant Director David Lightfoot, OAD Staff Associate Fae Korsmo, BCS Division Director Peg (Marguerite) Barratt, and BCS Senior Science Advisor Tom Baerwald addressed the COV to brief the members on selected issues including the Government Performance and Results Act (GPRA), the Directorate and Divisional structure, and conflicts of interest.

### **Summary Observations, General Recommendations and BCS Responses**

The Division of Behavioral and Cognitive Sciences is extremely grateful for the input provided by the Committee of Visitors, and especially for the leadership of Lila Gleitman in chairing this process. Endorsement of the efforts of the Program Directors and of the portfolio of funded projects is reassuring.

This response document addresses on a point by point basis the concerns raised in Dr. Gleitman's introductory comments as well as the detailed reports on each of the programs. Because of the variability among the nine disciplinary programs, specific comments on specific programs are an essential complement to the overall responses.

### **Programs and Practices**

#### **Program Directors - understaffed**

In fact, BCS has now two more Program Directors than it did at the time of the 2003 review: Kellina Craig-Henderson for Social Psychology and Terry Langendoen for Linguistics/Cyberinfrastructure. In addition, hires are underway for two more new positions: Perception, Action, and Cognition and Cognitive Neuroscience/Linguistics. Two of the new positions are across areas, as suggested in the COV report. NSF staffing is very limited with only a few new positions to all of NSF each year.

**Program Directors - attendance at conferences**

It is certainly true that having more staffing would allow more attendance at meetings and conferences; however, funding for travel is also an issue. S&E money is not plentiful, and the final amount for the year is not allocated until mid-June. Nevertheless, the 2006 S&E budget for BCS was redirected to fund a significant increase in travel.

**Program Directors - administrative support**

Vacant positions have plagued NSF and BCS. Difficulties with restructuring position descriptions, job titles, and responsibilities have led to significant delays in filling vacancies, and thus limited administrative support. Hiring is underway currently to address staffing concerns and relieve the short staffing. The addition of two Science Assistants since the 2003 review has been very helpful.

**Program Directors - rotators**

In fact, the ideal would be having about half rotators and half permanent Program Directors. Rotators bring new ideas and contacts within the research community; permanent Program Directors bring stability and continuity. The actual number of permanent Program Directors has an ebb and flow that is in some ways hard to predict; permanent Program Directors were lost since 2003 due to a detail at another agency, two retirements, and a resignation that accompanied a move to another organization. By the end of summer, we expect to have replaced two rotators with permanent Program Directors.

**Program Directors - advisory groups**

The idea of using former Program Directors and disciplinary leaders to assist with strategic planning is very good, and has been used effectively in some of the BCS programs. Expanding this to more programs will be useful.

**Review Process - panels**

Constant attention to including underrepresented minorities on review panels has served to increase their presence relative to 2003. The COV suggestion to use more panelists from non-academic institutions is good and, to some extent, is in practice currently.

**Review process - ad hoc reviews**

Indeed it is problematic and time consuming to bring in top quality ad hoc reviews for all proposals. Since 2003, the NSF systems have made it easier to customize request letters, to automatically send reminders, and to keep track of returned reviews. The COV report contains a number of useful suggestions that will be considered during serious discussion of the merit review process in 2006/2007. Probably most crucial among the suggestions are those linked to providing more recognition, involvement, and feedback to ad hoc reviewers.

**Review process - reporting to applicants**

It is indeed the case that the amount of detail in the reviews, panel summaries, and review analyses is quite variable; that variability has been reduced somewhat since 2003 with requirements for a more full weighing of the evidence. This subject will continue to be addressed during training of new Program Directors, and will be included in a full and considered discussion of the merit review process.

**Portfolio - size of award and success rate**

Pressure to address success rate has indeed lead to serious cutting of project budgets. It is agreed that there is a need for balance between large and smaller awards to reflect the contributions of each. It is indeed the case that some programs have unacceptably low success rates, and allocations of new money among the programs have included this as one important factor.

**Portfolio - interlocked disciplines and methodologies**

There is considerable additional effort to joint reviewing of proposals: additional ad hoc and panel reviews and discussion by two panels. Nevertheless, Program Directors consider this essential for good review of many projects. In accordance with COV suggestions, this will continue.

**Portfolio - high risk proposals**

As for the remainder of NSF, BCS struggles to support truly innovative and transformative research. Program Directors will continue to be hired and trained with this in mind. As well, instructions to panels will encourage extra consideration of the work that is truly different and potentially paradigm shifting. The planned Program Director discussion of the merit review process has the potential to address this.

**Dissertation proposals - award size**

Individual programs will take under serious advisement increasing the dissertation support from a maximum of \$12,000 to \$15,000 or \$16,000. Some programs have already agreed to do so.

**Broader impacts**

NSF has five very specific questions about broader impacts, but PIs only need to address one or more of these items. On the other hand, for the five questions on intellectual merit, all five must be satisfactorily discussed. The planned Program Director discussion of the merit review process has the potential to address this. Panelists should have in front of them the five NSF criteria for broader impacts as well as the fuller NSF description of these items. Perhaps Program Director discussion of the merit review process will lead to specific BCS examples.

**Underrepresented groups**

Further development of the Science of Broadened Participation may help address the participation of underrepresented minorities as reviewers, panelists, and PIs. The COV offers an interesting suggestion for the REU program to provide a more meaningful research experience over duration of longer than a summer.

**Data**

At many points, the COV commented on limitations in the data available to address relevant questions. Data needs will be shared more broadly with NSF in the hopes that systemic changes can make the capturing of relevant data easier.

**ANTHROPOLOGICAL AND GEOGRAPHIC SCIENCES (AGS) CLUSTER****Archaeology/Archaeometry Program  
Response prepared by Program Director John Yellen**

The three COV members who evaluated the Archaeology Program did, in my opinion, an excellent job and provided a total of 15 recommendations. As Program Director I am extremely grateful for and appreciative of the time and effort they devoted to this process. I categorize these suggestions below and comment on each.

**Recommendations which affirm current Program practices**

1. *Keep the doctoral dissertation improvement grant review process unchanged.*

**Program Director Response:** I am happy to comply.

2. *Dissertation classical and historical archaeology proposals should be held to same accepted anthropological standards of theory and methodology as all other dissertation proposals.*

**Program Director Response:** I agree and shall continue to do so.

3. *Given the increased multidisciplinary and sophisticated method and theory reflected in proposals, expand potential reviewer pool to include individuals with the necessary technical and theoretical expertise.*

**Program Director Response:** I attempt to do this now and shall continue the effort. Many current reviewers are non-anthropologists selected for their competence in non-anthropological specialties.

**Recommendations which are both practicable and amenable to rapid implementation**

4. *The Archaeology Panel currently consists of 6 members chosen on the basis of geographic and chronological expertise. Expand the panel by up to perhaps 3 members selected on the basis of specific analytical/technical expertise.*

**Program Director Response:** I think this an excellent suggestion and shall discuss this with current panel members at the Spring 2006 meeting. Assuming agreement, I would expand the panel, possibly in increments, beginning next Fall. It should be possible to identify individuals who embody both technical as well as anthropological expertise. Chemical analysis, geology, botanical and faunal analyses are excellent candidate areas.

5. *Increase the maximum doctoral dissertation award size from \$12,000 to \$15,000. Keep the success rate relatively unchanged by reallocating funds from other Program areas.*

**Program Director Response:** I agree and shall do so.

6. *Expand the definition of eligible proposals in the archaeological component of the High Risk Research in Anthropology competition. Go beyond geographic exploration to include projects “that challenge conventional wisdom and push the edges of theory and method.”*

**Program Director Response:** While the current “High Risk” program announcement does not preclude such projects the single archaeological example provided is geographic in nature. It would be reasonable to add language which encourages other types of research.

7. *To encourage increased reviewer response, write an essay about the professional and ethical responsibilities of peer reviewing and publish it in the American Anthropological Association and Society for American Archaeology newsletters.*

**Program Director Response:** I agree. While the SAA article should have a single archaeologist author, the AAA newsletter might most appropriately be co-authored by the three anthropology program directors.

**Recommendations dependent on coordination with and/or increased support from non-Program NSF sources**

8. *Send an automated reviewer reminder letter after 30 days to non-responders.*

**Program Director Response:** Yes, the automated system with support staff help can accomplish this.

9. *Share review compliance data with reviewers for annual faculty evaluations.*

**Program Director Response:** This would provide an excellent carrot to encourage increased reviewer response. It would however require considerable time if accomplished on an ad hoc program-specific basis. If done on a broader more systematic basis, Division, Directorate or NSF-wide effort and expertise would be needed to develop and implement an automated system. This idea should be discussed at a cross-program level.

10. *Devise a system/process to evaluate long term effectiveness of Archaeology Program awards. The COV in particular noted doctoral dissertation grants.*

**Program Director Response:** In response to Congressional mandate the Foundation has worked to develop measures of award effectiveness. Measurement of success is a complicated issue. However some questions such as number of dissertation grantees who become practicing professionals or who submit senior proposals are, in principle, straightforward. With additional staff support, probably at the Science Assistant level, it would be valuable to conduct such a review.

11. *Establish a HOMINID specific web site or URL which provides information on awarded projects and promotes the competition.*

**Program Director Response:** HOMINID is a cross-program initiative and thus requires multi-program consultation. I think that the web site idea is well worth serious consideration.

12. *Require HOMINID pre-proposals.*

**Program Director Response:** The intent of this recommendation, as I understand it, is to encourage HOMINID submissions. A pre-proposal would allow potential applicants uncertain of the appropriateness of their project to obtain guidance with only a minimal amount of work on their own part. The pre-proposals would be for comment/suggestion only and not formal approval/rejection. I think that this is an interesting idea which deserves exploration discussion by relevant Program Directors.

13. *Provide additional archaeology support staff.*

**Program Director Response:** A lovely idea.

### **Recommendations which elicit Program hesitation/concern**

14. *Encourage the submission of REU-Supplement requests.*

**Program Director Response:** The Archaeology Program maintains a URL on its website which sets out Program specific REU-supplement requirements. PIs may request a maximum of \$4,000 per student for up to two individuals. The Program requires that the students be named and a specific project/agenda be described. Although this sets the bar higher than many other NSF programs, a two page statement is normally sufficient and the success rate approaches 100%. The Program does not actively promote such supplements beyond including relevant information on its web site. I have several concerns about advertising this opportunity in a more proactive manner. In FY05 the Program provided first or continuing increments to 63 projects; all 63 PIs could have potentially applied for REU support and a maximum of \$504,000 could, in theory, been expended in this way. This calculation does not include PIs with still active standard awards from past years. While providing research opportunities for deserving undergraduates has intuitive appeal the underlying issue, from my perspective, involves the best use of very limited Program funds. With a relatively constant Program allocation, an increasing proposal load and a sharply dropping success rate, I question allocating more money to such supplements. While many students would benefit from such support and while for some individuals a REU supplement might make a crucial life changing impact, my guess is that the percentage of such cases is low. Thus I would prefer to leave the current low-key advertisement system in place.

15. *Ask potential referees for a commitment to review a proposal and require (as far as possible) a yes/no response.*

**Program Director Response:** I recognize that the underlying goal of this recommendation is to increase the effectiveness of the review system and increase reviewer response. I am also appreciative of the fact that the COV recognizes the extra effort involved and has suggested augmenting Program support staff. However I fear that the increased work burden would be significant and would fall on the Program Director's shoulders. Under the current system many reviewers when they receive an automated review request respond directly to me. Although

many reviewers are “new” – usually individuals I don’t personally know - it is clear from their emails that they are using the opportunity to establish a personal/professional relationship with the Program Director. (Many of these emails unfortunately require a response since they raise other issues “I had meant to contact you to explore a potential ...”) Thus I think a system which requires direct interaction would only work well if the Program Director were involved. Given the number of requests sent out this would entail significant Program Director time. Although objectivity is difficult, I question whether the benefits would significantly outweigh the costs.

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## **Cultural Anthropology Program**

### **Response prepared by Program Director Deborah Winslow**

#### **Introduction**

It should be pointed out at the outset, that the COV felt that the Cultural Anthropology Program has been well managed and that its funding choices have resulted in excellent science. This is a credit to years of effective Program management by the recently retired Program Director, Stuart Plattner.

The areas of concern that the COV had were similar to those of previous COVs: a need for broadened participation, a need for greater staffing, better instructions to reviewers (about criteria and the use of the summary scores), and the need to sustain support for integrating research and education, particularly through methods training for the future generations of cultural anthropologists. The one area that the most recent COV noted that I believe the earlier one did not was the need to find a way to broaden the kinds of cultural anthropology supported, which they saw as a matter of missed opportunity.

#### **A1: Questions about the quality and effectiveness of the program’s use of merit review procedures.**

1. & 2. Overall, the Visitors for the Cultural Anthropology Program seemed generally supportive of how the merit review process has been carried out. They seemed to find the mix of review mechanisms and their effectiveness, as well as the timeliness of reviews, appropriate. Where they expressed concerns, some of the concerns had more to do with the current (2006) year and the difficulties of handling the 35 percent increase in DDIG proposals than with the three-year period actually under review. While I share their concerns—and do not plan to repeat the experiment with soliciting ad hoc reviews for DDIG proposals—this does not reflect on the 2003-05 period.

3. The COV suggested that evaluation of research design and research methods be more clearly distinguished from evaluation of intellectual merit. This would require more specific instructions to reviewers.

**Program Director Response:** I think this makes good sense. A template specifically mentioning research design could be developed. This can be reiterated in the request for the review.

4. The COV suggested that the PO should clarify any discrepancies between the panel recommendation and the final recommendation.

**Program Director Response:** This is now Program practice.

7. The COV suggested more diversity in selection of reviewers.

**Program Director Response:** A laudable goal, but one easier to implement in certain ways (geographic, institutional, and gender diversity) than in others (diversity of race and ethnicity), given the available information. On the other hand, I am not sure there is evidence that our reviewers are not diverse. The advisory panels have always had good balance of gender and some ethnic and racial diversity. I am currently working to increase diversity on the advisory panels.

### **A2: Implementation of Merit Review Criteria**

1-3: The COV notes, correctly I believe, that the reviewers generally weighted intellectual merit over broader impacts.

**Program Director Response:** I believe this is correct and, to some extent, inevitable, given that our intention is to fund the best science we can. However, I think that the research we are funding does indeed have significant broader impacts and I will try to do more to point that out.

4: The COV notes uneven assignment of overall evaluation scores.

**Program Director Response:** I believe they are correct in this, although I think the effect of the differences is mitigated significantly in the review narratives and, most importantly, in panel discussions. This is part of the reason we do not average scores. This variability also reflects the different perspectives of different reviewers who are in fact selected for those different perspectives.

### **A3: Selection of Reviewers**

1. In response to the question about numbers, the COV noted a lack of diversity.

**Program Director Response:** Diversity is an ongoing concern and being addressed variously.

2. The COV lauds the expertise of reviewers, and their geographic and institutional variability. They ask for more diversity by topical interest and underrepresented groups.



**Program Director Response:** As part of a general effort to broaden the reach of the Cultural Anthropology Program, I have been actively seeking reviewers and panelists from a wide range of research perspectives in Cultural Anthropology.

#### **A4: Portfolio**

1. Happily, the COV lauds the quality of the science funded.
2. They recommend an increase in the DDIG award ceiling.

**Program Director Response:** Obviously, without a budget increase, giving larger awards means giving fewer awards. I do however agree that this is an ongoing problem that inhibits research and also the stature of NSF awards. It does not, however, inhibit the number of applications. Nevertheless, I think they might be right that the time has come to implement an increase and would suggest a BCS-wide discussion of appropriate funding levels for DDIG awards.

3. The COV suggests more high risk and innovative projects.

**Program Director Response:** The Cultural Anthropology Program has a High Risk Research solicitation in place, although it receives few applications. Perhaps more could be done to publicize this opportunity. As well, panels and Program Directors are paying increased attention to transformative research.

4. The COV has no problem with the number of interdisciplinary proposals, to the limited extent they can discern from the available data.
5. The COV concludes that the Program portfolio has an adequate balance of funding for centers, groups, and awards to individuals. In particular, they support the Program's on-going support of methods training programs.

**Program Director Response:** I have visited two of the methods training programs and agree that they are valuable for science in anthropology. Unfortunately, graduate programs are decreasing support for methods training, so we help to make up the difference. The methods taught do indeed include a balance of quantitative and qualitative methods, as the COV recommends.

- 6, 7, 8. The COV commends us for our rate of awards to new investigators, the geographic spread of investigators, and the balance of institutional types supported.

9. The COV also commends us for integrating support of research and education.

10. The COV expresses concern that the current Program portfolio does not support the full range of important contemporary research areas in Cultural Anthropology.

**Program Director Response:** I agree with this concern. To ameliorate it we need both a broader range of excellent proposals submitted and, perhaps, greater theoretical diversity on the advisory panels. The latter goal is easier to achieve than the former. But I have actively engaged in outreach to try to expand the sector of the anthropological research community that considers NSF a potential source of funding.

11. The COV expresses concern about funding for underrepresented groups.

**Program Director Response:** I think the available data are inadequate. Many PIs do not provide bio data on ethnicity and race. Furthermore, the NSF practice of not recording student co-PI data masks the fact that we have more gender, race, and ethnicity diversity than the data bases suggest. I plan to do more to keep independent Program records so that we can evaluate the issue with at least somewhat better data. That said, I also am making efforts to make presentations about NSF to organizations and schools with greater ethnic and racial diversity.

### **A5: Program Management**

1-4. The COV expressed appreciation of the way the Cultural Anthropology Program has been managed, which is a tribute to the previous Program Director. They also expressed concern about staffing support.

**Program Director Response:** I agree that additional staffing would be nice. It might free up PO time used in routine tasks to plan new directions and initiatives.

### **B. Outcomes**

The COV felt that Cultural Anthropology Program has been successful in achieving a high standard and support excellent research in all three of NSF's target areas.

### **C. Other Topics**

1. Areas needing improvement

Consistent with the rest of their report, the COV reiterated its concern for broadened participation through instructions to reviewers, targeted minority post-doctoral fellowship support, and greater diversity in selection of reviewers and panelists.

**Program Director Response:** These are laudable goals and should be implemented within the limits of what is permissible. The Cultural Anthropology Program panels are all somewhat diverse. We also fund a great deal of research that affects underrepresented populations. We will continue to try and improve. The minority post-doc program run jointly by BIO and SBE is available to cultural anthropologists.

## 2. Other Program issues

The COV is concerned about the thinness of information on the Cultural Anthropology web site. They recommend revamping it. They also found many of the Final Reports inadequate.

**Program Director Response:** I agree about the web site. Improving it is a project already under way. I also agree that many of the Final Reports are too thin, especially in their findings, and I have been rejecting them and asking for further elaborations.

## Geography and Regional Science Program

Response prepared by Program Directors Melinda Laituri and Tom Baerwald

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

#### 2. Is the review process efficient and effective?

*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.*

**Program Directors' Response:** GRS Program Directors generally use template-based e-mail messages to contact reviewers. This allows Program Directors to maintain a record of contact. However, in some instances, reviewers are contacted directly. In situations where a quick turn-around time is needed for the review, a telephone call or highly personal e-mail message will be used. For innovative or cross-disciplinary proposals, a follow-up telephone call may be used to clarify review criteria. To the degree its possible, GRS Program Directors will continue to use a range of media to communicate with reviewers in hopes of maximizing the number of reviews that receive.

7. Additional comments on the quality and effectiveness of the program's use of merit review procedures: *We recommend updating the NSF reviewer database. The Association of American Geographers is willing to assist in this effort, if desired.*

**Program Directors' Response:** The NSF reviewer database is in a constant state of flux. Program Directors, Science Assistants, and Program Assistants contribute to new names within the database on a constant basis. The database is full of redundancies, incomplete entries, and outdated information about the reviewers. Updating the reviewer database would require considerable effort that Program Directors can't undertake systematically at present given the current demands on their time. The GRS Program Directors will look to see if others could assist in this effort, exploring the possibilities for engaging science assistants, Program Assistants/Program Specialists, and possibly interns in this task. Membership information from the AAG could be a valuable source of information for this process.

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

3. Have the *review analyses* (Form 7s) addressed both merit review criteria?

Comments: *Yes, however, it appears that some of the reviewers are still unclear how to assess the relevance of the science to society.*

**Program Directors' Response:** The NSF merit criteria are outlined in the reviewer letter, the panel letter, and the NSF webpage. Prior to the start of the panel, the review criteria are addressed. Most reviewers have a good understanding of intellectual merit, but continue to struggle with broader impacts. The GRS Program Directors will try to identify additional ways through which they can identify the kinds of positive broader impacts that the Program seeks to support through the projects it supports. Among the media they will explore will be revisions in the content of the GRS web site and a written brochure that might be available from the web site or in hard-copy format. The broader impacts called for by NSF include more than relevance to society, for example, impact on education.

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

*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*

**Program Directors' Response:** The GRS Program Directors agree with this observation. They will look to make broader impacts more explicit in the description of projects in award abstracts and "nuggets" as well as through other media as noted in the previous response.

## **A.3 Questions concerning the selection of reviewers.**

2. Did the program make use of reviewers having appropriate expertise and/or qualifications?

Comments:

*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.*

*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.*

**Program Directors' Response:** GRS Program Directors agree with this recommendation. Panelists are invited to serve for a two-year period, which means they serve for four panel meetings. They represent the breadth and depth of geography. Because of fluctuations that may occur in the topics proposed from one panel meeting to the next, GRS Program Directors will explore options that would provide more flexibility, thereby enabling them to obtain a better fit

of reviews for the proposals in any specific round. Among the options they will consider are asking some panelists to serve for only one round at a time, asking some external "ad hoc" reviewers to do a set of four to six reviews in their areas of expertise (thereby providing them with a comparative framework similar the perspective of panelists ) without them serving on the panel, and making more targeted use of ad hoc reviews even in cases like the evaluation of doctoral dissertation research improvement (DDRI) proposals, which currently are reviewed solely by the GRS DDRI advisory panel.

3. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?

*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.*

**Program Directors' Response:** To some extent, non academic institutions are used in the review process, however academic institutions are the primary source for reviewers. Generally, it is easier to find the contact information for reviewers from academic institutions via their web pages. Private industry and NGOs are not as forthcoming with contact information via the Internet or by telephone. The GRS Program Directors will explore ways to try to communicate with geographers in non-academic organizations NSF's interest in having them serve as reviewers.

Reviewers may or may not identify their ethnicity or race; usually they do not. This makes it difficult to track representation from underrepresented groups. Explicit searches of HBCU and institutions catering to Native Americans or Hispanic populations are an excellent source for new reviewers. Updating the NSF database with reviewers from these institutions would be one move towards improving this situation. The GRS Program Directors will put special effort into trying to identify possible panelists by tracking down geographers and scientists in related fields who work in institutions that serve large minority populations.

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.*

**Program Directors' Response:** The database is incomplete rather than being out of date. It is constantly being updated when new reviewers are added. The problem is that there is no systematic method whereby the database is periodically updated. As noted earlier, the GRS Program Directors will look to identify others who can assist in updating the reviewer database

using sources of information like AAG membership information and responses from NGOs, private firms, and minority-serving academic institutions.

#### **A.4 Questions concerning the resulting portfolio of awards under review.**

8. Does the program portfolio have an appropriate balance of:  
Institutional types?

*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.*

**Program Directors' Response:** The GRS Program Directors agree that considerable research, innovation, and knowledge in geography reside outside of academia. The GRS Program Directors will look to undertake greater interaction with geographers and related scientists in non-academic institutions, both to make researchers in those organizations aware of possible funding opportunities at NSF and to facilitate greater scholarly interaction among geographers in all parts of the discipline.

11. Does the program portfolio have appropriate participation of underrepresented groups?

Comments:

*The program faces two difficulties: the real underrepresentation of nonwhites and Latina/o scholars in American academic geography, and the 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.*

**Program Directors' Response:** The GRS Program Directors have sought to involve a diverse range of individuals in their panels and among their reviewers, and they will continue toward that major objective.

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

*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?*

**Program Directors' Response:** Information regarding race and ethnicity is self-reported by the investigators, who may choose to provide all, some, or none of the information that's requested. The information that currently is gathered from doctoral candidates who seek support through

DDRI awards is in NSF databases, but it is not easily accessible since the PI is the faculty advisor. At future COVs (and at other times as necessary and appropriate), GRS Program Directors will look to do special tabulations to provide this kind of information for evaluators and decision makers.

#### **A.5 Management of the program under review.**

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

*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.*

**Program Directors' Response:** The GRS Program Directors will prepare a summary of major recommendations from this workshop and will use the recommendations in the revision of the GRS Program web site and in other appropriate media. They will also look to incorporate the recommendations in their future Program planning and operations.

4. Additional comments on program management:

*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.*

**Program Directors' Response:** Interest in integrated regional analysis and synthesis is growing in many fields, and the greatest potential to enhance fundamental scientific theory for this kind of research may well be through broader-based efforts rather than through focused activities solely with the GRS Program. While concurring with the general spirit of this comment, the GRS Program Directors note nearly 40 percent of the GRS Program budget supported the NCGIA during its formative years. Given the concerns expressed by the COV regarding proposal success rates, the GRS Program Directors believe that the broader geographic community should be engaged in discussions to assess whether the GRS Program should undertake a similar major investment in the near future. In the meantime, the GRS Program Directors believe that integrated regional analysis and synthesis should be explored more fully, and they plan to support a workshop to explore its potential for enhancing theory and education in geography over the next year or so.

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

*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.*

**Program Directors' Response:** Completion of the final report from the earlier GRS Program retreat will provide a basis for considering future workshops. The idea of conducting one or a series of workshops to address some significant and promising areas for geographic research and education deserves very serious consideration, and the GRS Program Directors will give strong consideration to this request over the next year. At present, they believe that there will be value in convening a limited number of workshops, although the workshops will need to be organized and conducted in ways that enable them to have the greatest impact possible on geography and related communities. Among issues to be addressed are the topics for such workshops (with integrated regional analyses and syntheses likely being one, although other topics are less specific); whether workshops should be convened by and conducted at NSF or whether they should be convened by members of the community and held at scattered locations; the audiences to which workshops should orient their discussions, recommendations, and products; and the specific charges that should be given to facilitate the workshops having the most beneficial possible impacts on the field.

**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, 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.*

**Program Directors' Response:** The GRS Program has been very proactive in terms of soliciting joint review of proposals to obtain shared funding of awards, thereby stretching the GRS budget. Numerous cross-cutting activities also are particularly suited for geographic research, and GRS outreach efforts will continue to place strong emphasis on identifying other possible sources of funding for geographic researchers to try to alleviate steadily growing pressure on the GRS Program budget. Although GRS Program Directors will continue to try to fund as many researchers proposing innovative, theory-enhancing projects as possible, they will not try to



maximize the number of awards (thereby increasing the success rate) if that strategy will result in award sizes being too small to enable funded researchers to carry out their projects effectively.

*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?*

**Program Directors’ Response:** As noted earlier, data on the demographic characteristics of students seeking support through DDRI awards are not immediately available. GRS program Directors will try to develop a retrospective database in the next year to determine whether the doctoral candidates seeking DDRI funding reflect the diversity of the total geography grad student population. If the DDRI applicants are less diverse than the broader population, the GRS Program Directors will become more aggressive in doing outreach to ensure that underrepresented groups become more aware of the potential for obtaining DDRI support.

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

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

**Program Directors’ Response:** The GRS Program Directors appreciate the initial analysis conducted by the COV members, and they will look to monitor this distribution in future competitions.

### **Physical Anthropology Program Response prepared by Program Director Trudy Turner**

The three COV members evaluated the Program and provided some suggestions. These are discussed below. I am extremely grateful to the COV members for their thoroughness and thoughtfulness in evaluating the Program. Their time and their insights are greatly appreciated.

#### **1. Practices that affirm current Program practices**

The COV found the Physical Anthropology Program to be “extremely well managed”.

COV members were supportive of the current proposal review practices. The combination of panel and ad hoc reviews for senior grants were deemed appropriate. Reviews gave sufficient information to the PI. Panel summaries and review analyses were found to adequately reflect the

reviews and gave sufficient information to PIs. Panel summaries and review analyses addressed both merit criteria.

The COV members found that there were sufficient reviews and that the reviewers had the appropriate expertise to provide reviews

The COV found the Program supported proposals of high quality which were methodologically sophisticated, multidisciplinary and collaborative.

## **2. Concerns of the COV members**

### **A. Concerns within the Program**

#### 1. Did the program recognize and resolve conflicts of interest when appropriate?

The COV found that this did not always occur. The COV members found two instances where current collaborations on a manuscript were not reported by the reviewer as a COI. The COV member who recognized this had special knowledge as editor of the journal to which the manuscripts were submitted. There was no real way the Program Director could have this information. In the third case a reviewer reported a conflict and the review was released.

Vigilance is, of course, required for COIs, but is not always perfect. NSF provides foundation wide training in COIs in addition to directorate representatives who are available to discuss COI issues. The current and future Program Director will take care to avoid COIs as diligently as the former Program Director.

#### 2. Does the program portfolio have an appropriate balance: Across disciplines and subdisciplines of the activity and of emerging opportunities

COV members felt that one important subdiscipline of physical anthropology, human biology, was substantially underrepresented in terms of submissions and awards. The Program Director did not feel that the under representation was as dramatic as did the COV, however, the Program Director has noted some under representation of the field. Much depends on the way an individual categorizes a particular proposal. To help encourage additional submissions from human biology, the Program Director is funding two workshops this year that will examine emerging trends in human biology. The first workshop will be on biocultural research and the second will be on the ways in which human biology can integrate with the rest of physical anthropology. In addition, the Program Director has run a grants workshop at the American Association of Physical Anthropology meetings and has suggested a similar workshop for the Human Biology meetings next year. The Program Director has added a panelist to the senior panel that specializes in bioarchaeology, another subfield of physical anthropology that continues to emerge as a major research issue.

#### 3. Does the program portfolio have appropriate participation of underrepresented groups?

Based on the data it had available, the COV found that participation of underrepresented groups was not appropriate. In particular, records indicate that only 1/3 of proposals are submitted by women, within the limits of the NSF data system that relies on voluntary identification of gender, race, and ethnicity, this suggests a concern. Women make up more than half of the physical anthropology association. Additional workshops on grant writing and NSF funding opportunities may aid in the support of women seeking funds. The COV also suggested that this issue might be a topic of study in the division.

4. Does the program portfolio have an appropriate balance of projects that integrate research and education?

The COV members were concerned that with the increase in the number of dissertation proposals, the success rate of applications decreased. Over the past two years, the number of dissertation proposals has doubled; the number funded remains the same. The COV, recognizing that nurturing the next generation of scientists is vital, suggested that the number of dissertation proposals funded be increased by 1.5 to 2 times of the current level, even if it means decreasing the number of senior proposals funded. The Program Director agrees with this suggestion and will begin to implement it this spring.

5. 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?

While the COV felt that reviews were sufficiently detailed, they wondered about a mechanism by which a reviewer could suggest supplemental methods, approaches or questions without jeopardizing the funding outcome. This is an excellent question and one not easily answered. Perhaps, the best mechanism for this remains with the reviewer who can emphatically state that the suggestion should not jeopardize funding.

## **B. Concerns that depend on coordination with or increased support from non-Program NSF sources.**

1. Are awards appropriate in size and duration for the scope of the projects/

The COV members noted that many grants were significantly reduced in funds from the original request. As a result, the scope of the work was also reduced. While the COV felt that the budget reduction was in most cases wise management, they also wondered if it might indicate that physical anthropology was under-funded, especially with regard to larger projects. The Program Director agrees that an increase in funding would allow for larger projects of longer duration and scope.

2. Additional comments on program management

The COV notes the heavy workload of the Program Director and urges allocation of a Science Assistant to Anthropology. The Program Director gratefully concurs. At the moment, Science Assistant effort is deployed for seriously overburdened Program Directors.

## Cognitive, Psychological and Language Sciences (CPL) Cluster

### Cognitive Neuroscience Program Response prepared by Program Director Michael Smith

*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.*

**Program Director Response:** It is agreed that there could be better representation of the panel from more senior investigators, and in the current panel the PD has made an effort to include a mix of both senior and junior panelists. It is also agreed that a larger panel might provide better topical coverage and reduce the necessity of relying on ad hoc reviews. The inference concerning rapid turnover in panel membership during the period reviewed by the COV might be in part a misconception, as on average most of the panelists during the 2003-2005 period served 3-4 panel meetings.

*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.*

**Program Director Response:** The inference that the panel has historically been comprised largely of methodologists appears to be a misconception. While this might have had some truth during the early period of the Program, over the last 5 panel meetings no more than 1 or 2 of the panel members have had a methodological focus, with the other 8-10 members at each meeting being neuroscientists, psychologists, or content specialists. We will continue to attend to this balance.

*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.*

**Program Director Response:** Ad hoc reviewers are recruited specifically for their expertise in the topic domain of the proposal being considered. It is agreed that it is often the case that ad hoc reviewers opinions differ from those of panel reviewers, but it is also noted that they are typically judging proposals in isolation rather than in a normative context relative to other proposals being reviewed. Efforts will be undertaken to increase the attention that panelists pay to the specific expertise offered in ad hoc reviews. It is also agreed that the response rate for ad

hoc review requests is frustratingly low. The current PD is exploring the use of a two stage ad hoc reviewer recruitment process, where a more personalized letter inquiring about interest is first sent to a candidate reviewer, followed by a more formal follow-up request to those who express interest.

*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.*

**Program Director Response:** It is agreed that diversity of opinion in the reviewers does not automatically constitute a signal for rejection, and that truly innovative research proposals are disproportionately likely to elicit a broad range of reviewer's opinions. The current PO recognizes that support of potentially transformative research requires that risks be taken on the Program management side of the equation, and that the advisory panel is only making a recommendation to the Program rather than a funding decision. The current Program Director routinely provides one-to-one guidance to PI's of promising yet declined proposals to help them identify areas of weakness that could improve the probability of success for subsequent submissions.

*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.*

**Program Director Response:** It is agreed that a shorter turn around time would benefit all concerned, providing that more rapid proposal processing does not undermine the quality of the review process. The current Program Director is aiming to speed the period from proposal receipt to final decision-making. This process may be facilitated by having a larger review panel (and thus reducing the necessity for soliciting large numbers of ad hoc reviews), an avenue that will be explored in the next fiscal year.

*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.*

**Program Director Response:** Since many submissions to the Program are revised applications it is agreed that it would be useful to incorporate a more standardized institutional mechanism for recognizing that fact. The Program will explore the possibility of including an explicit "revise

and resubmit” category in the panel review process, and also explicitly informing PIs whose proposals fall into that category that they should discuss the resubmission with the cognizant PO prior to resubmission in order to insure some continuity of reviewers over subsequent reviews. The Program will also explore the feasibility of permitting a one page letter “supplementary document” from the PI to be submitted along with the proposal resubmission that summarizes the revisions.

*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.*

**Program Director Response:** It is agreed that the budgets permitted by the Program’s current level are inadequate to the needs of much innovative work in cognitive neuroscience. Hopefully this situation will improve with anticipated increases in NSF’s overall budget in coming years.

*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.*

**Program Director Response:** It is agreed that the goal of identifying and funding truly high-risk, innovative research may be at odds with the inherent conservative nature of the peer-review process. NSF’s SGER program aims to compensate for this difficulty, and the Cognitive Neuroscience Program will explore adding a link to the SGER program on its website and potentially adding language to the Program announcement that PIs should consider utilizing this mechanism for more unconventional research ideas.

*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...In addition to the review panel serving as a source of information about future trends, perhaps ... the PO could convene a group of investigators who might deliberate about future trends.*

**Program Director Response:** It is agreed that such input could be very valuable for shaping the future direction of the Program. The Program Director will explore instituting a regular closing session for panel meetings that is focused on such brain-storming, and also alerting panelists to that fact a priori so that they have an opportunity to solicit input from their colleagues on the topic. It is also the case that the Program Director is currently planning one or more workshops to be held at NSF this fiscal year that explicitly will examine important future trends in neuroscience that are particularly ripe for such targeted investments. The Program Director will also explore the possibility of organizing small lunch time sessions at national and international meetings that focus specifically on discussion of critical emerging topics.

*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 proteomic 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 address the connectivity and timing relations among these regions. Significant support for imaging and statistical techniques will be needed to allow this area to mature.*

**Program Director Response:** Both of these areas that the COV members see as important emerging opportunities are being considered for focused discussion in the workshops that are being planned, and will be priority areas for funding in the future. They are already identified in the Program Announcement as areas appropriate for funding by the Program.

*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.*

**Program Director Response:** It is agreed that the Program would benefit from active management with a longer-term perspective on the Program than that which can be afforded by a rotator position alone. The effectiveness with which the Program's resources have been managed has historically been undermined by the fact that the impact of decisions that are made by Program Directors are sometimes only felt long after the decision-makers have moved on. More critically, for a relatively new area with broad importance and with a high potential for greater NSF-wide emphasis in coming years, effective Program development can demand the type of long term planning and strategic thinking that would be more likely to occur in a stable management environment. Nevertheless, the new perspectives and new ties to the research community that come from rotators are valuable; continuity can be enhanced through both continuity at other levels and continuity of panelists.

## **Developmental and Learning Sciences Program<sup>1</sup>** **Response prepared by Program Director Paul Klaczynski**

### **I. QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCEDURES**

#### **Is the review process efficient and effective?**

*COV response: Yes and no*

*The COV was concerned that, despite the large number of ad hoc reviews requests sent for each review cycle, the percent of these requests that declined is high. This concern was raised by the previous COV as well. The COV recognized that DLS program officers have appropriately identified expert reviewers but believed there might be some means of soliciting reviews that would increase the probability of that identified experts would agree to provide reviews. The committee speculated, “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.” Additionally, the COV suggested that the role and importance of each external review be highlighted in requests and that review requests be more fine-tuned to indicate to each reviewer that she or he is “THE expert” in the area; essentially, the COV recommendation was to amend the procedure such that the crucial role each external reviewer plays is perceived as crucial.*

**DLS Program Director Response:** The COV’s comments are well-taken and, to a large extent, reflect factual information. However, individual reviewers do not know the number of other review requests made for a given proposal; they may therefore have no basis for assuming that “any one potential reviewer may feel his or her contribution is not crucial.” It could be the case that the more familiar a given reviewer is with NSF’s ad hoc solicitation process, the more likely she or he is to know that multiple requests have been made and, as a consequence, to believe that her or his review is not crucial. The DLS Program Director concurs that letters to potential reviewers could be written to further expound the value of the service and could be made more appealing to reviewers by indicating that the reviewer is one of a select few who are sufficiently expert to review a proposal.

Nonetheless, these suggestions may have low pay-off. The difficulties in increasing ad hoc reviews likely extend beyond appealing more individualistically to a reviewer’s expertise. Specifically, reviewers do not directly benefit from serving as reviewers. Unlike some journals, NSF does not publicize a list of ad hoc reviewers. Universities may give some lip service to the fact that reviews provide an important service to NSF, but do little in terms of rewards (e.g., merit pay) that might provide incentives to review. Similarly, NSF does not provide anything beyond a “thank you” letter; serving as a reviewer for NSF neither increases nor decreases the probability that a reviewer will receive NSF funding for his or her own future proposals. Although NSF maintains records of requests to and responses from individual reviewers, little or no use of made of these records—except that Program Directors become wary of experts who never or rarely provide reviews and, with reviewers whose response rates are high, may come to rely too heavily on those reviewers. New reviewers are constantly sought to keep expertise up to date, and these may need mentoring in the NSF ad hoc system and its value.



## **2. Is the time to decision appropriate?**

*COV response: Yes and no*

*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*

**DLS Program Director Response:** NSF promises that 70% of the proposals will be processed within 6 months and that goal has been met each year. Nevertheless, DLS aims higher. The committee should be made aware of the possibility that decisions are not made as rapidly as they might be because of (a) the workload of individual POs, (b) the possibility that a decision to fund is put “on-hold” pending budgetary and other revisions requested by the panel and/or Program Director, and (c) PIs do not always respond to these requests in a timely manner. Since 2002, there have been four DLS Program Directors. Each new director must be trained, mentored, and develop his or her own style to deal with a high workload most efficiently. Depending on the degree of mentoring, competing demands on the Program Director’s time, own abilities, and the Program Director’s attempts to remain active as a researcher, the time a given Program Director takes to orient to NSF may vary somewhat. Regardless, however, if Program Directors do not remain in the position for more than a year and if the number of DLS submissions increases further, delays in making some final decisions are likely to occur again in the future.

## **3. Additional comments on the quality and effectiveness of the program’s use of merit review procedures**

*COV response*

*The COV was concerned that the panel size may sometimes be insufficiently large to deal with the number of proposal submitted during a particular round. When panelists are faced with reviewing 14 or more proposals, the task may be daunting, the quality of reviews may suffer, and panelist morale (and enthusiasm for attending future panel meetings) may decline.*

**DLS Program Director Response:** Every attempt is made to keep panels small enough to ensure high quality discussion and, at the same time, to ensure that panelists review no more than 12-13 proposals. Difficulties arise when panelists cannot attend panel meetings; in those cases, Program Directors invite additional experts to join the panel, sometimes on a 1-time-only basis, to keep the number of proposals/panelist reasonable. The feasibility of creating sub-panels will be considered, although this could increase the workload of the DLS Program Director, could increase the monetary expenditures of NSF, and could further increase existing difficulties in arranging panel meeting logistics.

## **II. IMPLEMENTATION OF NSF MERIT REVIEW CRITERIA**

*COV response*

*The COV provided affirmative answers to each of the three questions about implementation of NSF merit review criteria. However, the COV did state, “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."*

**DLS Program Director Response:** Agree. Panelists and reviewers typically weigh broader impacts after intellectual merit because their sense is that discussion of the former is fruitless if intellectual merit criteria are not met. This is an entirely reasonable approach. Panelists will not, and should not, recommend funding proposals that, although the broader impacts of well-conducted research along the lines a given PI proposes may be extraordinary, is the science is not meritorious, these impacts will not be realized (or, in the worst case, the research could produce misleading data and could have a detrimental impact on, for example, social policy).

It is, however, the case that the extent to which PIs, reviewers, and panelists address "broader impacts" varies considerably. In part, some of this variation results from the relatively clear implications a PI's research could have. For example, drawing out the educational implications of research focused on determining the social and cognitive mechanisms underlying individual differences in the ability to shift between "standard English" and "African-American English," and how these differences relate to academic achievement, is somewhat easier than making clear how social change might be effected by determining the reasons for normative developmental progressions in infants' abilities to detect subtle variations in 2- versus 3-dimensional objects that are either stationary or in motion.

This concern has come up during panel discussions; in their written reviews, panelists and ad hoc reviewers—perhaps as a function of the theoretical and research traditions from they come—seem to have an implicit understanding that the potential for social impact is greater in some research domains than in others. This is not an unfair assumption that reviewers might make. To some limited extent, there could be a trade-off between the precision with which research is conducted and the types of broader impact claims researchers can they can make. Although the DLS Program Director does not believe an extensive content analysis of previous reviews is warranted, infant perception, action, and cognition researchers and reviewers seem less likely to expound on broader aspects than, for example, adolescent socialization researchers. It would be interesting to compare the broader impact reviews of DLS infancy researchers with those of adult perception researchers. It would seem that, if it is the case that non-infant PAC reviewers effectively address broader impacts better than DLS infancy reviewers, then DLS reviewers might benefit from examining some PAC reviews.

On the other hand, panelists—and the DLS PO—might more rigidly enforce the broader impacts criterion. For instance, regarding ethnic and racial diversity, infant PAC researchers mention infrequently whether their samples will be racially diverse or the extent to which their findings will/will not generalize to infants from diverse backgrounds. At the same time, many research institutions are located in culturally, racially, and ethnically homogenous areas. In such areas, broader impacts could be made more apparent by, for example, forming partnerships with researchers in urban areas and/or minority-serving institutions or appreciating that diversity also comprises variability within the racial majority culture (e.g., as a function of geographical location, isolation, etc.).

Although the foregoing paragraphs have singled out infancy and adolescent socialization researchers, and PAC was the sole program against which potential contrasts were drawn, the DLS Program Director's intent was to illustrate the types of contrasts that often arise in reviews of DLS proposals and the sorts of difficulties with which researchers—and reviewers—in some DLS-relevant areas must contend.

DLS would most certainly welcome continuing advise on how the “broader impacts” criterion might be broadened. The current DLS Program Director will solicit recommendations from the Spring 2006 panel in this regard. Efforts will be made to be sure that ad hoc reviewers and panelists understand the five questions related to broader impacts and have available the NSF document that expands on these.

### III. QUESTIONS CONCERNING THE SELECTION OF REVIEWERS

#### **1. Did the program make use of reviewers having appropriate expertise and/or qualifications?**

*COV response: Yes*

*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.*

**DLS Program Director Response:** NSF requires that each proposal be reviewed by a minimum of three experts. The tradition in DLS has been, and will continue to be, to assign each proposal to two panelists. As a consequence, only one external review is required. However, when panelists appear to lack expertise, the DLS Program Director is likely to seek multiple ad hoc reviewers. As the COV noted, affirmative responses to ad hoc requests are far from the norm. As a result of this fact and as a function of the likelihood that assigning more than two panelists to each proposal would overload panelists, even when panelists have appropriate expertise, the DLS director must search for an external reviewer until at least one agrees to provide a review. A large number of reviews on a particular proposal may reflect co-reviewing by another program and thus the inclusion of more perspectives.

#### **4. Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?**

*COV response: Cannot evaluate: Need more data*

*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 checklist 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.*

**DLS Program Director Response:** Reviewers are currently asked to voluntarily provide this information, however most do not choose to do so. Program Directors attempt to take diversity into account in selecting reviewers and are offered training to do so. The type of reviewer checklist the COV suggested, and strong encouragement to complete it, would be ideal and could be part of the electronic review submission process.

*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 region is unknown. We were surprised to see no report of international reviewers.*

**DLS Program Director Response:** The lack of information concerning international reviewers is surprising. For most ad hoc reviewers, this data entered into PARS and hopefully will be available for the next COV.

#### **IV. QUESTIONS CONCERNING THE RESULTING PORTFOLIO OF AWARDS UNDER REVIEW**

##### **2. Are awards appropriate in size and duration for the scope of the projects?**

###### **Comments:**

*COV response*

*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, e.g., staff termination and rehiring.*

**DLS Program Director Response:** At present, the only solution—which itself is untenable—to this difficulty is to fund fewer projects overall. The anticipated NSF budget increase may improve this situation.

##### **3. Does the program portfolio have an appropriate balance of innovative/high-risk projects?**

*COV response: Yes and no*

*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.*

*Recommendation: We recommend that a significant portion of the expected new resources be earmarked for innovative, high-risk projects.*

**DLS Program Director Response:** Agree. However, before any portion of DLS funds is earmarked for innovative, high-risk proposals, a clear definition of and set of guidelines for determining the extent to which a proposal is innovative and high-risk seems useful. Panelists are likely to differ from one another in their definitions; the DLS Program Director will put this question to the panel. It should also be noted SGER proposals are submitted infrequently and calls for SGER proposals are infrequent, typically made during or immediately after extraordinary events, when the research is clearly time sensitive. The Program Director will attend to increasing high risk, transformative research.

#### **4. Does the program portfolio have an appropriate balance of awards to new investigators?**

*COV response: NO*

*The term “new investigator” was unclear to us. Does it mean “new to NSF” or “recent Ph.D.”?*

**DLS Program Director Response:** The current DLS Program Director attempted to clarify for the COV and discovered that “new” means “new to NSF.” It does not, therefore, refer to any specific point in a PIs’ career (e.g., “new investigators” are not necessarily untenured).

*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.*

*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.*

**DLS Program Director Response:** Although in principle the DLS Program Director concurs that a balance of awards among new, mid-career, and senior investigators would be ideal, it has been, and will remain to be, the case that awards will be made to those investigators—regardless of time in career—whose research is more likely, primarily in the judgment of the panel, to result in significant empirical discoveries and theoretical advances. Nonetheless, if time permitted, it might be worthwhile to pursue the COV’s recommendation and quite interesting to determine the degree of overlap between the awards to “new investigators” as typically conceived outside of NSF and “new investigators” in the NSF conceptualization.

#### **7. Does the program portfolio have an appropriate balance of geographical distribution of Principal Investigators?**

*COV Response: No*

*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.*

**DLS Program Director Response:** The COV's report may be accurate for the sampled proposals, however this is unlikely the case for the full set of proposals. Certainly, attention will be paid to geographic distribution in the future.

**8. Does the program portfolio have an appropriate balance of institutional types?**

*COV response: Yes*

*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.*

**DLS Program Director Response:** Concur, particularly with the recommendation to encourage more submissions from 4-year colleges. For both 2- and 4-year colleges, developing a mechanism that would allow scholars at those colleges to be mentored by and collaborate with scholars at research universities seems like a promising approach. Publicizing the Research Opportunity Awards could help address this.

**9. Does the program portfolio have an appropriate balance projects that integrate research and education?**

*COV Response: Yes and no*

*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.*

**DLS Program Director Response:** Agree that universities are more frequently compelling faculty to seek extramural funding for graduate students. In addition, it is not uncommon for Program Directors for require budgetary cuts in funded proposals. NSF is explicitly interested in furthering education, and this will be conveyed more explicitly.

**V. QUESTIONS CONCERNING PROGRAM MANAGEMENT**

**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.*

**DLS Program Director Response:** Lack of continuity is a serious problem, particularly in dealing with budgetary issues and maintenance of continuing awards, because cycling through 1 director/year leaves almost entirely unfamiliar with prior awards and with funds already

committed to continuing awards. Training, typically from an academician to an administrator, takes far too much time. Most serious is the problem of having a single Program Director. The workload on a Program Director makes it difficult to maintain an active research program, despite the 50 days NSF allows for independent research from its directors. The DLS Program would be far better served by hiring a second Program Director—this would allow both Program Directors to use their research days effectively and improve the speed with which grants are processed.

<sup>1</sup> *All COV comments, whether paraphrased from the COV report or quoted directly from that report, are in italics. In some cases, COV comments are abbreviated and only the issue at the center of COV's report is included.*

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## **Linguistics Program**

### **Response prepared by Program Director Joan Maling**

#### **A3 SELECTION OF REVIEWERS**

1. *Did the program make use of an adequate number of reviewers?*

“All proposals in the sample received at least *two* ad hoc reviews” - [italics added]

**Program Director's Note:** this is in addition to one panelist review. The Program Director believes strongly in the peer review system, and believes that a combination of ad hoc and panel review provides the best evaluations and feedback to the PIs. All proposals receive at least three reviewers. In general, only one of these is a panelist review; all other reviews are ad hoc reviews.

3. *Did the program make appropriate use of reviewers to reflect balance among characteristics such as geography, type of institution, and underrepresented groups?*

It is true that panel members are almost exclusively from research institutions; the majority of ad hoc reviewers are from research institutions. The COV report suggested that this may not be appropriate for type of institution: “insofar as there is a desire to increase the diversity of institutions that receive grant funding, there should be a concomitant effort to diversity the panel and reviewer pool with respect to institutional type.”

**Program Director's response:** efforts have been directed at increasing the competitiveness of proposals submitted by indigenous tribal organizations and individuals, cf. the Zepeda award; the proposal was solicited by the Program Director. The Program Director has also tried to identify new reviewers, especially junior researchers and minority researchers, at conferences. These efforts will continue. NWAWE may be added to the list of outreach conferences; this conference has a high percentage of minority researchers who study African-American English.

#### **A4. PORTFOLIO OF AWARDS**

2. *Are awards appropriate in size and duration for the scope of the projects?*

The COV found the average award size to be too small. The average award for regular research proposals is \$75,000 per year including indirect costs; awards rarely exceed \$100,000 per year (including indirect costs) unless another disciplinary program is co-funding. The COV report wrongly concludes that “PIs receive a maximum of roughly \$50,000 per year.” This is a miscalculation; assuming a 50% Indirect Cost rate, PIs would get about \$65,000 in direct costs per year, not \$50,000. Nonetheless, the Program Director agrees that even this amount is too small given the increasing costs of research, especially the increasing cost of supporting graduate student research assistants, something the Program considers to be an important goal.

**Dissertation awards:** At present about 2.5% of the Program’s annual budget goes towards funding dissertation proposals. Although the COV suggested that the Program consider funding more dissertation awards, no cap exists on the number of dissertation awards. The Program funds all dissertation proposals that the panel recommends for funding.

The COV report also recommended that the Program reexamine the policy of supporting direct research expenses only and not providing fellowship stipends for dissertations. The budgetary limitations do not reflect Program policy, but are rather part of the DDIG solicitation for SBE. [http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf05574](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf05574)

As stated in the solicitation, doctoral dissertation research improvement awards are intended to provide supplemental funds for items not usually available from the student's U.S. academic institution; these awards are not intended to provide the full costs of a student's doctoral dissertation research, and are not intended to provide fellowship support. Other funding mechanisms exist for graduate stipends.

**Conference awards:** At present about 2.5% of the Program’s annual budget goes towards funding workshops and conferences. I have no data on whether or not the Linguistics Program supports more conferences (either absolute numbers, or as a percentage of the budget) than other programs. The Advisory panel has engaged in passionate debates about the role that conference support plays in the field. Program policy is not to support regular annual conferences. The one apparent exception to this is the ongoing support for the Boston University Conference on Language Development, an international conference which plays a pivotal role in the field. Both NSF and NICHD provide financial support for this important annual conference, with a focus on increasing support for the active participation of graduate students.

In the view of the Program Director, neither conference support nor dissertation support has a significant effect on award size and duration for regular research grants. As in other programs, the tension is between increasing award size and increasing success rate. It is impossible to do both without a significant increase in the program budget.

3. *Does the program portfolio have an appropriate balance of innovative/high-risk projects?*



The COV report says no. Program Director agrees that this has not been a focus. Accordingly, efforts will be made to consider new approaches to encouraging and funding high-risk projects, including more publicity of SGER proposals.

8. *Does the program portfolio have an appropriate balance of institutional types?*

The COV report states that “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.” And goes on to suggest that 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.” This is the result of sampling; in FY2005 several proposals from Native Americans were funded (and at least one more was funded, but as a DEL fellowship, it was transferred to NEH for administration.)

Institutional diversity: I agree that it is good to get researchers in small departments at four-year colleges involved in the review process. They may not have big research labs, but might be good reviewers, and reading proposals can give them a sense of what it takes to get something funded.

10. *Does the program portfolio have an appropriate balance across disciplines and subdisciplines of the activity and of emerging opportunities?*

The COV report recommends increasing the share of funding for the core disciplines (syntax, semantics, morphology and theoretical phonology) on the grounds that students flock to where the funding is. The Program Director agrees that the strength of the field depends on continued innovation in basic scientific research in the core subfields. The success of interdisciplinary research depends on strong input from the core subfields. These issues of portfolio balance will be discussed with the Linguistics Advisory Panel.

11. *Does the program portfolio have an appropriate participation of underrepresented groups?*

As noted in the COV report, the demographic data produced by the system is often significantly at odds with the data provided by Program Directors. In recent years, the Program Director has tracked the gender and minority status of awardees. Possible reasons for the discrepancy in the data are (i) the gender/minority status of the thesis advisor (the PI) as opposed to the dissertating student (the co-PI) on Doctoral Dissertation awards, and (ii) whether or not data on co-PIs, if any, are included, and (iii) whether or not data on supplements are included. REU-supplements in particular present the same classificatory problem as dissertation awards: is the goal to promote diversity in the advisors, the PIs of record, or in the students actually supported by the awards?

Examples of awards that significantly promote diversity:

- LeMaster supplement 0523355 supported a deaf Eritrean woman.

- Edwards 0505392, award to Sealaska Heritage Foundation, a Tlingit non-profit corporation; Nora Dauenhaer who is Tlingit is one of the research scientists on the project.
- Littlebear 0505138 - Native American PI
- Johnstone supplement 0506506 supported a black woman
- Sikorski 0504190 Native American female PI
- Zepeda 0549189 Native American female PI, for outreach to Native American tribal communities
- Phillip Cash Cash, 0504944 DEL fellowship transferred to NEH
- Justin McBride 0505286 DEL fellowship transferred to NEH, (award to Kaw Nation of Oklahoma)

Other projects where PI is not a minority nonetheless include significant minority involvement; for example:

Susan Penfield 0505209 - DEL award that trains tribal members and involves them in the data collection: "The project actively involves tribal members in the data collection by training them in elicitation procedures using video and audio equipment. The project team will consist of two tribal members from each group (Mohave and Chemehuevi)."

## **Perception, Action and Cognition Program**

### **Response Prepared by Program Director Christopher Kello**

#### **INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT**

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

*A.1.2. 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.*

**PAC response:** Institutional communication of the kind recommended is more appropriately done at the division or directorate level, rather than the program level; this will be discussed. As for the number of reviews, thorough panel discussion can act as a third review in cases where a proposal is for little money, as in a conference or dissertation proposal. However, efforts are always made to secure at least three reviews.

*A.1.3. The COV thought that some reviews could usefully have been more informative and more specific. 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.*

**PAC Response:** PAC will edit the reviewer instructions that are sent out with each review request to encourage more clear and structured reviews as well as bringing to reviewer's attention the five specific questions on intellectual merit and the five specific questions on broader impact.

*A.1.5. 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.*

*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.*

**PAC Response:** The PAC Program does not use a numerical method for combining and weighing the review ratings. However, PAC panelists are asked to prioritize proposals that are placed in the “must fund” category. PAC review analyses will include the panelists’ prioritizations.

*A.1.6. 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).*

**PAC Response:** With regard to the 12% over nine months, proposals are sometimes held if they might be funded by future monies, in which case PIs are informed of their status. Also, it may take time for PIs to secure IRB approval and come up with an approved budget, which is necessary in order to make an award.

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

*A.2.1. 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. RECOMMENDATION: Better specification of the meaning of “broader impact” needs to be given to the applicants and the reviewers. Progress reports should document success in achieving proposed broader impact.*

**PAC Response:** The definition of “broader impacts” is made available to both applicants and reviewers. PAC will consider whether a clarification can be crafted that would help to standardize the review criteria. As for progress reports, it currently contains a number of fields that are directly related to broader impacts, such as fields for contributions other than publications

*A.2.3. The COV found that in almost every case that we reviewed the review analyses were identical to the panel summaries.*

**PAC Response:** Review analyses are now written separately from the panel summaries. Note that the audience for the panel summary is the PI; the audience for the Review Analysis is internal.

### A.3. Questions concerning the selection of reviewers.

*A.3.1. 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. The COV noted that a sample of proposals appeared to receive only two reviews. 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. 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. RECOMMENDATION: Require a minimum of three reviews for each proposal.*

**PAC Response:** In fact, NSF is precluded from providing ad hoc reviews and panel summaries to anyone but the PI. Linguistics does not do so. Institutional communication of the kind recommended is more appropriately done at the division or directorate level, rather than the program level. As for the number of reviews, the panel summary can act as a third review in cases where a proposal is for little money, as in a conference or dissertation proposal. However, efforts are always made to secure at least three reviews. Although NSF does not allow sharing of other reviews and the panel summary, the NSF may refer the reviewer to the public abstract of awards. Perhaps this could be automated eventually.

*A.3.2. 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.)*

**PAC Response:** The number of reviews is addressed in A.3.1. As for the distributions, see A.3.3.

*A.3.3. 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.*

**PAC Response:** This discrepancy is probably due to the fact that the ad hoc return rate for “Research 1” universities is much lower than for other types of institutions. This discrepancy may also be due to missing and/or incorrect information in the reviewer database. NSF staff make efforts to update the database whenever possible, and other efforts to increase the ad hoc response rate may help to increase the proportion of reviews from Research 1 universities.

#### A.4. Questions concerning the resulting portfolio of awards under review.

*A.4.3. 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. 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.*

**PAC Response:** The PAC Program Director has and will continue to encourage panelists to identify “risky” proposals. PAC will also consider whether it is feasible to have a separate panel for “risky” proposals.

*A.4.5. The COV viewed only awards to individuals.*

**PAC Response:** The PAC Program also funds a small number of collaborative projects, typically consisting of two investigators at two different institutions.

*A.4.6. The COV noted a tendency to fund more proposals submitted by 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. RECOMMENDATION: Better identify CAREER proposals in the eJacket system for future COVs.*

**PAC Response:** The title of CAREER proposals must begin with the word “CAREER”. Future COVs can be instructed to identify CAREER proposals by their titles. CAREER awards are not numerous because they are \$400,000 at a minimum.

*A.4.8. 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. RECOMMENDATION: Better identify success rates by institutional types.*

**PAC Response:** This information was not readily available in EIS, but PAC will try to find this information for future COVs.

*A.4.9. 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. 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.*

**PAC Response:** These comments will be forwarded to the relevant parties at NSF. Students may apply for Graduate Research Fellowships as undergraduates for support for their first year of graduate school.

*A.4.11. Data Not Available*

**PAC Reply:** This information was made available in the PAC report prepared for the COV.

#### A.5. Management of the program under review

*A.5.3. The COV was not given any information about program planning or the prioritization process that guided the development of the portfolio.*

**PAC Response:** This information will be provided for future COVs. In fact, the PAC research portfolio reflects the investigator-driven ideas that arrive in proposals as evaluated by panelists and Program Director.

*A.5.4. 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.*

**PAC Response:** PAC and BCS will make efforts to maintain continuity across rotators, and to secure permanent staff for PAC. The advantages of the new ideas that come in with rotators must be balanced against the need for stability.

## **PART C. OTHER TOPICS**

*C.1 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.*

**PAC Response:** PAC will consider more explicitly including research on emotion. The Program Director will have this discussion with the Advisory Panel.

*C.3 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 interdisciplinary research, since PIs on group proposals would not necessarily all be from the same field.*

**PAC Response:** NSF currently has a collaborative proposal mechanism that satisfies the above criteria. PAC will disseminate this information more broadly.

*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.*

**PAC Response:** The PAC Program Director recently attended an outreach activity in Kentucky, and such efforts will be continued.

*C.4 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.*

**PAC Response:** SBE and the NSF in general are currently working on plans and mechanisms for NSF's future role in funding the neurosciences. In fact, current practice is to have PAC-relevant proposals with a neuroscience component come to PAC with joint review by the Cognitive Neuroscience Program; similarly for social neuroscience proposals. Cognitive Neuroscience is decreasingly inclined to fund methodological work.

*C.5 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.*

**PAC Response:** These COV procedural suggestions will be considered when organizing future COV meetings.

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## **Social Psychology Program**

**Response prepared by Program Directors Amber Story and Kellina Craig-Henderson**

The Committee of Visitors commended the Social Psychology Program in its management of the Program, the quality of its portfolio and its role in helping NSF reach its Strategic Outcomes Goals of People, Tools, Ideas and Organizational Excellence. The COV was particularly enthusiastic about the current inclusion of one permanent Program Director and one rotating Program Director, and praised the role this dual system has played in improving the management of the Program.

The COV did have specific comments of areas that could be addressed and improved:



*In terms of the review process, the COV was concerned that the broader impacts of the proposed research were not adequately discussed by the principal investigators, reviewers or panelists. They also noted that when broader impacts were discussed, they were often limited to student training, and encouraged the program officers to promote a broader and more thorough understanding of broader impacts and the role they play in funding decisions.*

**Program Directors' Response:** The BCS management is aware that the merit review criteria of broader impacts is often overlooked or underweighted. The Program Directors of the Social Psychology Program make it a point to include a lengthy discussion of both merit review criteria in all their outreach activities. The National Science Foundation has a detailed description of activities that are representative of broader impacts on its website. This 5- page document will be printed out and sent to all panelists of the Social Psychology panel. In addition, a reference to this website will be added to the description of "broader impacts" in the review request letter, and it will be added to the Program Directors' email signatures. Thus, more individuals will have access to this very informative document and should infer from the salience of the discussion of broader impacts that it is an important criteria in funding decisions. It may be useful to develop more BCS-specific examples.

*The COV noted that in addition to the lack of discussion of broader impacts, the panel summaries in general provided little information to the principal investigator. They note that the funded proposals appear to garner little enthusiasm and the tenor and text of the summaries do not differentiate funded from non-funded proposals.*

**Program Directors' Response:** The Social Psychology Program strives to provide the principal investigator with timely, detailed and constructive feedback and takes this responsibility very seriously. Recently, the Program Directors have provided the panel with panel summary templates that explicitly ask the scribe to comment on both strengths and weaknesses in relation to the intellectual merit and broader impacts of the proposed work. The Program Directors however did not require that the scribes use this template, and in fact few did. We will certainly take the introduction of a standard panel summary template as a requirement under serious consideration.

*The COV expressed concern with the time at which reviews for the Fall panels are sent to PIs. They indicated that this was problematic in some cases because reviews were not received in time for PIs to resubmit for the January deadline.*

**Program Directors' Response:** The Social Psychology Fall panel date is determined by panelists' availability and is relatively stable. The Social Psychology Program Directors recognize the challenge for some PIs who may wish to resubmit, and a concerted effort is made to process those proposals for which the panel encourages a resubmission in a timely enough manner to permit immediate resubmissions. In the past, proposals that are clear declines have been processed after these. However, we can make a greater effort at providing reviews to PIs for all proposals in a shorter time frame. In fact, quickly revised proposals often do not fare well.

*The COV noted that it would have been helpful to have more information on how the panel uses the ad-hoc reviews, and whether they are submitted in time for panel discussion.*

**Program Directors' Response:** The panel actively discusses the ad hoc reviews during the evaluation of each proposal. This is especially so when there is a glaring inconsistency across reviewers' and panelists' evaluations. In general, the ad hoc reviews are submitted in time for the panel meeting and discussions. When a request to review is sent to a potential reviewer it is accompanied by a firm due date for receipt of the review. In the event that the review is not received on or shortly before the due date, the Social Psychology Program Directors send out reminder letters. In rare and exceptional cases, delinquent reviews are received after the panel has met. These reviews are fully considered in the Program Directors' review analyses and final funding recommendations.

*They also noted that it was difficult to comment on the quality of the reviewers as information concerning race, ethnicity, gender, type of institution, and geographical location had to be inferred.*

**Program Directors' Response:** We share this concern. In fact, demographic information is solicited from reviewers and panelists, on a voluntary basis. The majority of reviewers do not report this information. Given the large number of individuals that are called upon to review, it would be difficult if not impossible for the Program Directors to track this information themselves in an accurate manner. It may be possible to make the request for demographic information more salient to the reviewers when they enter the Fastlane system to submit their reviews. Suggestions will be provided to NSF personnel regarding this matter.

*The COV praised the high quality of the research included in the program's portfolio, but expressed some concerns over the balance. They commended the use of smaller "seed money" grants to more junior investigators and suggested formalizing the mechanism. However, they were concerned that fewer junior PIs were awarded funding in 2005, compared to the previous two years. They also noted that the trend toward larger grants could selectively hurt junior investigators, as well as negatively affect the funding of innovative transformational research.*

**Program Directors' Response:** The Program Directors in Social Psychology agree with the COV and share their concerns over funding for early career investigators. We will continue to award smaller incentive grant awards for junior investigators (in addition to full-size awards) as this system has proved very successful in promoting the careers of these junior investigators and their future grant opportunities. It is true that a lower percentage of new PIs were funded in FY05 compared to FY03 and FY04; however, that decline mirrors an overall decline in the funding rate for all PIs applying to the Social Psychology Program that year. The COV is correct in identifying the trend toward larger grants as an important factor in the overall reduced funding rate. As the Program funded fewer small grants for workshops that year, the distribution of award grant size moved up on the scale. However, the Program Directors disagree with the COV that this trend may have damaging influences on the funding of innovative work, as grant size is an imperfect predictor of creativity and risk.

*The COV was impressed by the high quality of the funded projects, but expressed dismay at the large number of proposals that were recommended for funding by the Social Psychology*

*Advisory Panel that did not ultimately get funded. The COV cites that in FY04 and FY05, approximately 56% of recommended proposals were left unfunded.*

**Program Directors' Response:** The Program Directors in Social Psychology agree wholeheartedly with the COV and note that this situation is not necessarily unique to the Social Psychology Program. However, it is true that the budget for Social Psychology Program has not significantly increased since 1997, thus hindering our ability to fund the scientifically important work that has been recommended for funding. The specific needs of the Social Psychology Program will be discussed with BCS and SBE management. The anticipated increase in NSF funding may help ameliorate this.

*The COV expressed concern about the low number of proposals submitted by minority investigators, and correspondingly the number of grants awarded to members of underrepresented groups. The COV recommends that further efforts should be made to identify more minority PIs as well as ad-hoc reviewers and panel members. They also suggest that it is of critical importance to support the research of early career scientists from underrepresented groups.*

**Program Directors' Response:** The Program Directors in Social Psychology share the COV's concern about broadening participation and appreciate the COV's suggested pathways to this goal. The Program Directors will strive to identify outreach opportunities with greater minority representation, such as the reception for minority scholars at the annual meeting of the Society of Personality and Social Psychology, and the annual meetings of SACNAS for Chicano and Native Americans in Social Science, and the Association of Black Psychologists. We will also consider special conferences and workshops that highlight themes that would draw the attention of underrepresented groups.

*Although the COV acknowledged that the program portfolio appears diverse, they also suggested that the program officers should identify new types of outreach to further identify emerging areas of research.*

**Program Directors' Response:** This is an important activity, and as suggested by the COV one that can be accomplished through attendance at non-mainstream conferences beyond SPSP. In order to identify new areas and outreach to new audiences, the Social Psychology Program Directors will plan to attend non-mainstream meetings that are likely to include social psychologists in attendance (e.g., the International Society for Research on Aggression, the International Association of Relationship Research, and the National Association for Ethnic Studies, as well as smaller pre-conference meetings such as the Social Cognitive Neuroscience pre-conference before SPSP).

*The COV appropriately noted a dearth in proposals submitted by and awarded to minority PIs. In addition, they suggest that greater efforts should be made to identify minority ad-hoc reviewers and panel members.*

**Program Directors' Response:** This continues to be a concern for the Social Psychology Program Directors, and greater efforts will be made to increase the diversity of PIs, ad hoc

reviewers, and panelists. The Program Directors will expand the net of outreach audiences to systematically target organizations and institutions likely to be populated by minority PIs in social psychology that may not have previously been addressed.

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In addition to the standard feedback solicited from the Committee of Visitors, the Social Psychology Program posed several program-specific questions to the program's COV. The goal was to solicit the COV's opinions and guidance on the specific topics.

*The first question referred to the declining emphasis on social developmental psychology in the social psychology program given the creation of the Developmental and Learning Sciences program. The COV noted that the funding rate of proposals that were primarily social developmental in nature declined over the period of the COV and thought that eliminating the reference to social development in the solicitation was justified. They also noted that doing so would reduce the need to have social developmental experts on the panel, which would represent a cost savings.*

**Program Directors' Response:** The Program Directors are appreciative of the COV's guidance on this topic. The possibility of updating the solicitation to make it more accurately reflect the Program's areas of emphasis (as well as those of other programs in the BCS Division) will be discussed with the BCS and SBE management. The Program Directors are not convinced, however, that it is feasible or even desirable to eliminate the social developmental expert from the panel, in that the Social Psychology Program and the Developmental and Learning Sciences Program will continue to engage in a high rate of co-reviewing proposals together.

*The second question asked the COV to comment on the perceived role of workshops and conferences in the social psychology program portfolio. The program had made an explicit decision to reduce the number of special workshops and conferences it supports, and requested feedback concerning that decision. The COV wisely noted that the program needs to maintain flexibility in supporting workshops and conferences so that activities that match the program's goals could be supported. They also noted that the Summer Institute of Social Psychology has been widely successful in promoting networking and inclusion among graduate students in the field of social psychology. They recommended continued funding for the Summer Institute.*

**Program Directors' Response:** The Program Directors agree with the COV that the Summer Institute of Social Psychology has been a very successful venture to enhance the training of graduate students in areas of studies they would not normally encounter, and to enhance networking among the students and faculty participants. The Program will make decisions on other worthy conferences, workshops and institutes on a case-by-case basis, weighing the intellectual merit and broader impacts of the activities, as well as the overall goals of the Program.

*The third inquiry concerned whether or not the Social Psychology program should consider participating in NSF's Doctoral Dissertation Improvement Award program. With the addition of a second program director, it was thought that the increased work load might be more feasible now than it had been in the past. The COV was clear that the workload would likely still make*

*this unfeasible. They suggested that the associated funds used to support these awards (as well as the review panels) would be better spent supporting student involvement in existing grants or minority supplements.*

**Program Directors' Response:** The Program Directors share the COV's workload concerns. They will seriously consider using the saved time and budget to explore other avenues and mechanisms to enhance education and training, and broadened participation.

*The final request for feedback from the COV pertained to promoting broadened participation. The program officers realize that even with their concerted effort to enhance diversity, more could be done to reach members of underrepresented groups. The COV offered several useful, practical suggestions.*

**Program Directors' Response:** The Program Directors are appreciative of the COV's attention to this matter throughout their evaluation of the Program. We will endeavor to enhance our outreach strategies to include gatherings with greater minority representation. As noted earlier, we will take steps to highlight the importance of the broader impact review criteria to PIs and reviewers to ensure that all are giving proper attention to broadening participation and diversity. We will also consider the possibility of specific competitions and/or workshops that highlight themes that might engage members of underrepresented groups. Partnering with SPSP in support of student travel to conferences is another avenue that will be taken under consideration.