A Descriptive Analysis of the Presidential Faculty Fellows Program:

Contributions to Science and Engineering through Leadership in Research and Teaching

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Table of Contents

Page

Executive Summary **1**
Study Overview 1
Findings 2
Summary and Conclusions 5

1. Introduction **7**
What is the PFF Program? 7
How Does PFF Compare to Other NSF Efforts to Support Young Tenure-Track Faculty? 8
Presidential Young Investigator Program 9
NSF Young Investigator Program 10
Presidential Faculty Fellows Program 10
Presidential Early Career Awards for Scientists and Engineers Program 11
Faculty Early Career Development (CAREER) Program 12
Similarities and Differences Among NSF's Young Faculty Fellowship Programs 13
Study Purpose and Methodology 13
Organization of the Report 14

2. Characteristics of PFF Program **15**
Participating Institutions 15
PFF Nominees and Awardees 16

3. Impact of PFF Program **23**
Impact of PFF Program on Fellows 27
Enhancing Capacity to Conduct Research 28
Promoting Fellows' Development as Academic Scientists 31
Disseminating Research Findings 32
Promoting Productivity and Accomplishments as Teachers 32
Enhancing Quality of Undergraduate and Graduate Instruction 33
Impact of PFF on Fellows' Efforts to Collaborate with Other Researchers and Practitioners 36
Contributing Expertise to the Public Sector 36
Contributing Expertise to Private Industry 38
Collaborating with Researchers and Scholars in Other Countries 38
Impact of PFF on Fellows' Efforts to Promote Opportunities in Science and Engineering 39
Promoting Increased Representation of Women and Minorities in Science and Engineering Fields 40
Working with Elementary and Secondary Schools 41
Supporting Teacher Education and Professional Development 41
Creating Science Enrichment Opportunities for K-12 Students 42

4. Summary and Conclusions **45**

Appendix A: Tenure-Track Faculty Who Received a PFF Grant **A-1**

Table of Contents (continued)

List of Tables

Tables

1	Characteristics of PFF nominees and awardees: 1992-95	3
2	Percentage of Fellows reporting PFF-related activities, by award year: 1992-95	5
2-1	Number of nominating/awardee institutions: 1992-95	15
2-2	PFF nominations, by Directorate: 1992-95	16
2-3	Characteristics of PFF nominees: 1992-95	17
2-4	PFF awards, by Directorate: 1992-95	19
2-5	Characteristics of PFF awardees: 1992-95	20
2-6	Characteristics of PFF nominees and awardees: 1992-95	21
3-1	Percentage of Fellows reporting PFF-related activities, by award year: 1992-95	26
3-2	Fellows reporting promotions, by award year: 1992-95	27

List of Exhibits

Exhibits

1	Data sources used in study	1
1-1	Summary of NSF programs designed to support young tenure-track faculty: 1983-present	10
1-2	Data sources	13
3-1	Linkage of PFF Fellow activities and types of achievements to NSF strategic goals	24

Executive Summary

Study Overview

Background. The Presidential Faculty Fellows (PFF) program was initiated in 1992 at the request of President George Bush to recognize and support the scholarly endeavors of tenure-track faculty. Administered by the National Science Foundation (NSF), from FY 1992 through FY 1995, the program provided a total of 120 young faculty with $100,000 per year for up to 5 years. Fellows could use PFF funding to (1) undertake self-designed, innovative research and teaching projects; (2) establish research and teaching programs; and (3) pursue other academic-related activities. By funding these activities, the Foundation sought to

- recognize, honor, and promote the integration of high-quality teaching and research in science and engineering fields;
- foster innovative and far-reaching developments in science and technology;
- create the next generation of academic leaders; and
- improve public understanding of the work of scientists and engineers.

In FY 1996, the PFF program was supplanted by the Faculty Early Career Development Program (CAREER). CAREER funded a much higher number of fellows annually (350 compared to 30) and allowed for variation in the amount and duration of funding across awardees. CAREER is also supplemented by the Presidential Early Career Awards for Scientists and Engineers (PECASE), a multiagency fellowship program that allows the recipients to receive a total maximum funding level of $500,000 for over 5 years.

This report describes the PFF-related experiences of the 120 faculty members who received financial support through the PFF program. It addresses the following issues:

- What were the characteristics of PFF nominees and awardees?
- What types of activities have Fellows undertaken?
- What is the range of achievements that have been attained by Fellows?

Exhibit 1.— Data sources used in study

- Proposal and award documentation for each of the 120 PFF Fellows
- Fellows' annual progress reports
- Fellows' 1998 resumes
- Fellows' Web pages
- Fellows' products (e.g., congressional testimony)
- EHR Impact Database
- Interviews with 11 Fellows
- Official NSF memoranda and materials

- What lessons about the PFF program could be applied to future NSF initiatives?

Study Methodology. The study of the PFF program relied heavily on existing materials to chronicle the activities and accomplishments of the 120 Fellows. To some extent, it can be considered an experiment in data mining, an exploration of the utility of trying to develop a rich understanding of a program's impact from routinely maintained documents. Exhibit 1 shows the sources of data drawn upon in this study.

Findings

Using the documents described in Exhibit 1 above, we were able to develop a picture of the institutions and individuals that participated in the program. The reports from the Fellows also provided some important insights into their accomplishments and the value of NSF's investment in their growth.

Participating Institutions. NSF sought nominations from all U.S. institutions that offered a baccalaureate, master's, or doctoral degree in fields supported by the Foundation. Over the four years from 1992 through 1995, 338 institutions nominated faculty members for the PFF award. Three-fifths of the institutions made more than one nomination over this period. Sixty-five percent of the nominations came from public institutions, with the remaining 35 percent coming from private institutions. In addition, 4 of the nominations came from institutions that were classified as being historically black colleges or universities (HBCUs).

Awards were made to 120 individuals at 82 institutions. The distribution of awards generally mirrored that of nominations.

PFF Fellows. A total of 1,183 individuals were nominated for the PFF program from FY 1992 through FY 1995 (the average number of nominees per year was 296). Table 1 shows the characteristics of nominees and awardees. The highest percentage of nominations was submitted to the Mathematical and Physical Sciences Directorate (28 percent), while the highest percentage of awards was made to the Engineering Directorate (37 percent). The PFF program was quite competitive, with only 10 percent of the nominees receiving an award.

Our analysis of the number of nominees and awardees revealed that the review process resulted in slight increases in the proportion of females, Asians, and underrepresented minorities becoming Fellows compared to their representation in the nominee population.

Table 1.— Characteristics of PFF nominees and awardees: 1992-95

Characteristic		Percent (FY 1992-95)	
		Nominees (n=1,183)	Awardees (n=120)
NSF Directorate	Biological Sciences	24.6	16.7
	Computer Science and Engineering	9.8	13.3
	Education and Human Resources	0.9	0.8
	Engineering	27.4	36.7
	Geosciences	4.3	4.2
	Mathematical and Physical Sciences	27.9	22.5
	Office of the Director/Polar Programs	0.0	0.8
	Social, Behavioral and Economic Sciences	5.0	5.0
Gender	Male	79.4	70.0
	Female	20.0	30.0
	Not reported	0.6	0.0
Race/ethnicity	White	79.0	72.5
	Black or African American	1.9	4.2
	Hispanic or Latino	3.6	5.0
	Asian	14.3	16.7
	Pacific Islander	0.2	0.0
	American Indian/Alaska Native	0.2	1.7
	Not reported	0.8	0.0
Minority status	Underrepresented minority[1]	5.9	10.8
	Non-underrepresented minority[2]	93.3	89.2
	Not reported	0.8	0.0
Citizenship status	U.S. citizen	76.0	73.3
	Permanent resident	22.7	25.8
	Temporary resident[3]	0.4	0.8
	Not reported	0.8	0.0
Region	Northeast	31.0	33.0
	Southeast	18.6	15.0
	Central	21.7	20.0
	West	28.3	30.8
	Territories[3]	0.3	0.8

[1]Includes black or African American, Hispanic or Latino, Pacific Islander, American Indian, and Alaska Native.

[2]Includes white and Asian.

[3]At this time, residents of U.S. territories would have been eligible for the program, though not reported as U.S. citizens or permanent residents.

NOTE: Percents may not add to 100 because of rounding.

SOURCE: EHR Impact Database and PFF program documentation.

Fellows' Activities and Accomplishments. Fellows' progress reports and curriculum vitae provided evidence of accomplishments in a variety of areas important to NSF and its mission. These include conducting research, disseminating research findings, and providing instruction to undergraduate and graduate students (Table 2).[1,2] In addition:

- Almost 70 percent of Fellows reported that they had shared their expertise with the public sector.
- Forty-seven percent reported that they conducted outreach activities that involved elementary or secondary school students.
- Thirty-eight percent forged relationships with international colleagues.
- Thirty-six percent had taken steps to promote increased representation of women and minorities in science and engineering fields.
- Twenty-one percent had shared their expertise with the private sector.
- Sixty-three percent had been promoted since receiving their PFF award (i.e. between FY 1992 or one of the later four years when PFF awards were made and fall 1998 when Fellows' current curriculum vitae were collected).

Fellows stressed that the flexibility of the PFF grants was extremely valuable to them as developing professionals. In contrast to other grant programs, the possible uses of PFF funds were constrained by far fewer restrictions. For example, the open-ended nature of the program enabled young scientists to accelerate the pace of their work and to explore new frontiers. Fellows considered this freedom to be one of the primary benefits of their award.

[1]The Fellows' accomplishments in many ways reflect the broad policy goals delineated in NSF's Strategic Plan (March 1998). These goals include (1) discoveries at and across the frontier of science and engineering; (2) connections between discoveries and their use in service to society; (3) a diverse, globally oriented workforce of scientists and engineers; and (4) improved achievement in mathematics and science skills needed by all Americans.

[2]Since the NSF Strategic Plan was developed after the PFF program was supplanted by CAREER, the format for the progress reports that were reviewed for this descriptive report could not have asked Fellows to address the categories in the Plan. The counts contained in this study, therefore, are likely to undervalue Fellows' contributions in essential areas.

Table 2. — Percentage of Fellows reporting PFF-related activities, by award year: 1992-95

NSF policy goal	PFF-related activity	Award year				
		FY 1992 (n=27)	FY 1993 (n=28)	FY 1994 (n=27)	FY 1995 (n=23)	FY 1992-95 (n=105)
1. Discoveries at and across the frontier of science and engineering	Maintain or expand research efforts	100.0	100.0	100.0	100.0	100.0
	Disseminate research findings (including publication of papers/articles/books).	100.0	100.0	100.0	100.0	100.0
2. Connections between discoveries and their use in service to society	Contribute expertise to the public sector	74.1	78.6	51.9	73.9	69.5
	Contribute expertise to private industry	22.2	17.9	22.2	21.7	21.0
3. A diverse, globally oriented workforce of scientists and engineers	Enhance quality of instruction for undergraduate and graduate students	100.0	100.0	100.0	100.0	100.0
	Promote increased representation of women/minorities in science and education fields	33.3	39.3	22.2	52.2	36.2
	Collaborate with scientists and engineers in other countries	37.0	50.0	33.3	30.4	38.1
4. Improved achievement in mathematics and science skills needed by all Americans	Participate in outreach activities involving elementary and secondary school students. (See also above: enhance quality of instruction for undergraduate and graduate students)	48.2	39.3	33.3	69.6	46.7

SOURCE: Grant award progress reports, Web pages, and other materials submitted by Fellows (e.g., current curriculum vitae collected in fall 1998).

Summary and Conclusions

The data suggest that PFF, although fairly small in scope, provided support to a talented and productive group of individuals. A wide range of activities have been undertaken by the 120 young faculty who received support through the PFF program–activities that impact the knowledge base, policy deliberations, and future of the next generation of scientists and engineers.

Although not an evaluation in the strict sense, the reports of the Fellows themselves attest to what can be accomplished through fairly modest investments of both dollars and professional support to young faculty in science and engineering. Equally as important, interviews with a sample of Fellows suggest that the program's direct and indirect impacts (e.g., on teaching practices, on innovative research that leads to important discoveries, and on promoting careers in science and engineering among K-12 students) will endure, and even multiply, long after PFF funds have expired.