

TRANSITION POINT ONE: ENTRY INTO GRADUATE EDUCATION

We found that due to the timing of the GRF fellowship award announcement the GRF generally does not affect admission to graduate programs; however, being an NSF fellow may influence recruitment efforts by programs, including financial incentives to enroll. Recruitment and admissions are two edges of the same sword that guards the gateway to graduate education. Although some institutions we visited have campus-wide recruitment programs, especially those focused on underrepresented groups, the major locus of recruitment efforts and admissions decisions for graduate study is at the department or program level. Faculty are keenly interested and involved in selecting each cohort of graduate students. We heard repeatedly how important it is to attract and enroll top students, in part because good students help graduate programs recruit and retain top faculty.

In the programs we visited, selection is highly competitive. Faculty and staff know very well the other programs they compete with for top students, frequently describing the admissions and recruitment arena in market terms indicating that they offer as much as they can to be competitive. This dimension of the academic marketplace sets the stage for future employment competition as well, a fact not lost on students seeking admission to the highest ranked programs.

Decisions on whether or not to apply to graduate school, where to apply, and which fellowships to apply for, are influenced by many factors, including perceptions about chances of success. The reputations of graduate programs and faculty are also important factors. For NSF fellows and their peers, reasons for enrolling in a particular program ranged from academic quality to personal preferences. The timing of the admission decisions, GRF award announcements, and enrollment choices makes recruitment strategies of some programs important factors in enrollment decisions. Since NSF fellows continue to be admitted to, enroll in, and complete degrees in highly ranked graduate programs, the selection criteria for the GRF Program appear to be consistent with the criteria used by top graduate programs.

Undergraduate Institutions

NSF fellows and their peers are most likely to have been undergraduate students at research universities. By 1993, more than 69% of Graduate Fellows (GF) received baccalaureate degrees from RU1 institutions⁸, up from 62% in 1979. For Minority Graduate Fellows (MGF) this

⁸ RU1 institutions are those that are classified as institutions offering a full range of baccalaureate programs, committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees each year. In addition, they receive annually \$40 million or more in Federal support. Other terms used in this report include RU2 (receiving between \$15.5 million and \$40 million per year in Federal support); Doctoral (awarding at least ten doctoral degrees in three or more disciplines, or 20 in one or more disciplines); and LA1 (primarily undergraduate institutions awarding 40% or more of their baccalaureate degrees in liberal arts fields and that are selective in admissions). (Carnegie Foundation, 1994)

change was even greater, from 33% in 1979 to 66% in 1993. Not only are recent GRF applicants increasingly more likely to have obtained their bachelor degrees from RU1 universities, these applicants continue to have higher fellowship award rates than applicants from other types of institutions. Furthermore, applicants and fellows are likely to come from a select group of those RU1 institutions. Seventeen percent (17%) of all GRF applicants come from ten institutions of baccalaureate graduation, representing almost one-third of applicants from the 88 RU1 institutions.

The institutions of baccalaureate graduation for GF fellows are even more concentrated, with 30% coming from ten institutions. The top three institutions of baccalaureate graduation for applicants to the MGF program and MGF fellows are Hispanic- or African American-serving institutions. Ten institutions of baccalaureate graduation produced 27% of MGF fellows. We found that institutions of baccalaureate graduation were even more concentrated when we broke the data down by disciplinary area. For example, almost one-quarter of 1979-1993 GRF fellows in the Social/Behavioral Sciences (SBS) graduated from five undergraduate institutions, as did one in five fellows in Engineering/Math/Physical Sciences (EMP) (Table G1).

In the 19 graduate programs we visited, those NSF fellows and peers interviewed who had attended U.S. institutions as undergraduates were most likely to have graduated from RU1 institutions (76.4% of fellows; 69.8% of peers).⁹ Peers who attended U.S. undergraduate institutions were more than twice as likely to have graduated from colleges and universities that do not offer the doctorate (8% of fellows compared to 19% of peers). Admission to these highly ranked graduate programs is very competitive, and there appears to be a clear advantage to having attended a research university as an undergraduate. As we will see, this is an even greater advantage for receiving GRF support.

The Graduate Admissions Process

For undergraduates, admission to top graduate programs is a process that begins in the junior or early senior year of college. Application deadlines vary by institution and even by graduate programs within institutions, but they typically occur in the fall of the year. As part of the process, students usually take the Graduate Record Exam (GRE), secure letters of recommendation, and complete separate applications, which often include personal essays, for each program. The decision of where to apply is a critical point in this process. Decisions are influenced by undergraduate faculty and advisors, peers, and family as well as by the student's perception of the graduate programs and chances of acceptance.

For the graduate programs, this is also a critical point, and faculty committees spend endless hours reviewing applications. Most of the programs that we visited encourage top applicants to visit the campus to meet with faculty and students. The university and/or department may even pay for part or all of the travel expenses. Sometimes these visits are coordinated in official

⁹ However, 13 peers and one NSF fellow had attended foreign universities that are not classified by the NRC.

weekend open houses where many hopeful applicants come to campus, and there are formal and informal activities and opportunities to learn more about the graduate program. Recruitment is an increasingly important function, particularly for programs that hope to increase the number of top students who enroll.

Roughly 10% of applicants to the program were admitted this year. The program conducts two recruitment weekends per year where 18-20 students are brought in each time to visit the program. (E-BIO)

The department has an active program for recruiting graduate students. It keeps records of students who inquire about its graduate programs and invites promising applicants to visit [Institution B] before admissions decisions are made. These visits are important to the department because it is competing for students against other quality graduate programs. Prospective students who visit the university have the opportunity to learn first-hand about its programs and what they offer. The department has found that it will not recruit the NSF fellow who has not visited the campus prior to the fellowships being awarded.... Faculty also observed that they have a tough time recruiting U.S. applicants. They have to increase stipends to be competitive with alternative choices, both other universities and corporations. Minorities are particularly hard to recruit since corporate American is also recruiting them. (B-ME)

We woo every student. Each faculty member is given a set of students to be called. But the NSF students are wooed more. We supplement their stipend with an additional \$1000 per quarter [for a total supplement of \$3000]. (D-EC)

A major factor for both students and programs at this point is the availability of financial support. Particularly for Ph.D. programs that actually or in effect guarantee financial support for five years (on average), the availability of funds is critical. Here we found great differences among the disciplines, even on the same campus. We also found that admission for Biochemistry, Mathematics, and Economics graduate programs are for doctoral study, although some admit a limited number of master's students. However, in Mechanical Engineering, admission may be (and in the case of Institution D is only) for the master's degree, with a second screening before admission to the doctoral program.

Beyond applicant qualifications, availability of financial support affects admissions decisions. In fact, offers of admission are normally coupled with offers of financial support. These offers are frequently some combination of teaching assistantships, research assistantships, and fellowships. All six institutions have some form of university fellowship, some for all disciplines and others that are targeted (e.g., for science and engineering at Institution D), and some for all students and others for underrepresented groups. These fellowships are frequently used to lure top applicants to enroll and may be for one year only or for several years.

The timing of admission decisions limits any potential leveraging effect of a GRF award as well as the enrollment choices for NSF fellows. Admission and financial aid offers may be made at or immediately following campus visits in January-February. Most admission decisions and offers are made by early March. According to the guidelines of the Council of Graduate Schools,

students have until April 15 to respond to offers of financial aid. Since the posting of GRF awards occurs in the third week of March, graduate admission decisions have been made and financial aid offers have been extended prior to the GRF award notification in the programs we visited. A subsequent GRF award usually requires a revision to the original financial aid offer. Institutional practices vary when an admitted student receives a GRF award. For example, at Institution B, every NSF fellow and all GRF applicants who receive an Honorable Mention (everyone in Quality Groups 1, 2, and 3) who are admitted to the university receive an offer of an additional \$5000 per fellowship year. At Institution D, the top 100 science and engineering students admitted are awarded a generous university fellowship that is articulated with the GRF for a total of five years of support.

Graduate programs vary in the extent to which they actively pursue admitted students who have received a GRF.

The department determines which of its admitted students have been awarded an NSF fellowship and then actively tries to recruit them to the university. The department from time to time supplements the NSF fellowship and Presidential Fellowship combination with funds from its own endowment. (B-ME)

The department does not assertively pursue students it has admitted who are then awarded a GRF. It does contact them and congratulate them on their achievement. (F-BIO)

The department does nothing special to encourage fellows to choose to enroll here-and acknowledges that it may lose some because of this. One administrator noted that "University X Medical School can buy students for another \$1000, but we won't." (C-BIO)

Staff matches students admitted to the NSF list and notifies recipients that [Institution D] will make up the difference in the cost of education. NSF fellows are invited to come to campus, and the Department pays for part of their travel. "We do actively recruit all NSF recipients.... Some of them don't know until they get my letter or e-mail that they got an NSF." (D-ME)

In cases of late admits or transfer students, having GRF support can influence admissions decisions, but this is not common. However, some students interviewed indicated that having the GRF did influence their admission to certain programs.

He believes the fellowship was influential in getting him admitted to [University C] from [University X].... Winning an NSF showed he "could compete with the entire world." He was contacted by someone and was admitted after he received his fellowship. (C-M)

Three of the four departments...did mention that receipt of a GRF might positively influence transfer and/or late admissions decisions. However, it was emphasized by most faculty that it would be unlikely for a student who has met the criteria for being awarded a GRF to be turned down via their standard admissions process. (A)

Although admissions decisions are made prior to the posting of NSF awards, the Graduate Program Coordinator commented about NSF fellows: "We love them, would admit almost anyone with one. The evaluation process they use selects the kind of student we want.... There is more competition, and fellows can choose." (E-M)

NSF GRF Application and Selection Process

The GRF Guidelines for Submission of Applications provides information on eligibility, the application process, and conditions of awards to potential NSF fellows (NSF, 1997a). Generally the GRF is intended for students at or near the beginning of graduate study in science, mathematics, or engineering fields. However, Women in Engineering and Computer and Information Science awards and the Minority Graduate Fellowship competition allow applicants to have completed more units of graduate study than Graduate Fellowship awards. The application includes academic records, GRE scores, references, and application forms, including information on previous research experience and a research proposal.

During site visit interviews, we heard both positive comments and criticisms regarding the GRF selection process. Although some faculty and administrators questioned the criteria used for selection, NSF fellows are generally recognized as outstanding students, which validates the selection process.

NSF fellows are seen as better students-they have been through two screenings, and the expectation is that they will "work out." (C-ME)

Concerning the eligibility criteria, we heard suggestions that GRF funds should be available to more advanced students who have had more exposure to research.

The chair believes that the criteria used to select NSF fellows are not the best in terms of selecting students who will be skillful researchers because of the emphasis on academic coursework and test scores. He also believes that the timing of applications and awards should be changed to allow students to apply during their 2nd year and receive the fellowship in years 3-5 of their program in order to allow students a chance to gain meaningful research experience before applying for the fellowship. (A-BIO)

The Senior Associate Dean also recommended that NSF consider providing opportunities to recognize "late blossoming stars". He believed that by allowing students to apply in their second year of graduate school when they could be showing more promise would result in even better quality fellows than at present. (C)

Applying for the GRF

Applications for the GRF are due early in early November, almost a year before a student begins graduate study or at the very start of the first year of graduate study. Most survey respondents and students interviewed had heard about the GRF as undergraduates from faculty and peers. Others heard about the GRF from more informal sources, including family. More than one in four WENG and MGF fellows first learned of the program when already in graduate school.

As shown on Table 1, 91% of Disciplinary fellows knew of the GRF Program as undergraduates.

Table 1
Hearing about the GRF Program

| | Disciplinary Peers | Disciplinary Fellows | WENG | MGF |
|----------------------------------|--------------------|----------------------|------|-----|
| Before becoming an undergraduate | 2% | 2% | | 1% |
| While an undergraduate | 53% | 89% | 73% | 72% |
| In first year of graduate school | 31% | 6% | 21% | 25% |
| Later in graduate school* | 11% | 2% | 6% | 2% |
| After graduate school* | 2% | 1% | | |

*An explanation for the fellows who indicate hearing about the GRF Program after the first year of graduate is that WENG and MGF fellows may apply after completing 30 semester hours or 45 quarter hours of graduate study. We have no explanation for how a Disciplinary fellow could hear about the GRF after graduate school.

We looked to see if there were differences among the discipline areas. Large numbers of the Disciplinary fellows heard about the GRF while undergraduates: 84% in Mechanical Engineering, 91% in Mathematics, 83% in Biochemistry, and 91% in Economics. For MGF fellows, 91% in Mechanical Engineering heard about the program while they undergraduates, compared to 75% of Mathematics fellows, 65% of Biochemistry fellows, and only 47% of Economics fellows. Information about the GRF Program is less likely to reach potential underrepresented applicants while they are still undergraduates, except in Engineering.

Graduate departments were influential for WENG fellows (cited by 30% of survey respondents.) For those Disciplinary fellows who applied as graduate students, graduate advisors were influential in the application decision. Several Biochemistry programs that we visited either required or formally encouraged first-year graduate students without external funding to apply for the GRF.

We asked those program peers who never applied for an NSF fellowship why they had not. Many were not eligible for the fellowship due to their citizenship status (37% non-U.S. citizens). Almost 30% did not think they would be able to win an award, and a similar number had other funding. Thus, most peers were not eliminated from the competition through lack of knowledge about the program, or by the effort involved in the application process.

The GRF Selection Process

After an initial eligibility screening, GRF applications undergo extensive panel review. About 260 faculty experts are convened each year for NSF by Oak Ridge Associated Universities into about 20 panels by subject area. For the Minority Graduate Fellowship competition, an additional group of 84 experts were convened into nine panels to review those applications. Reviewers are drawn from a wide range of institutions. Among the 1995 reviewers for the Graduate Fellowship, for example, the 261 panelists came from 157 different institutions, and no more than six were from the same institution. There were only seven members from three of the four institutions that enroll the largest numbers of NSF fellows. There also was a wide geographic distribution of panelists. One-fourth of the 255 panelists who provided race/ethnicity information were from underrepresented minority groups. Among MGF panelists for 1998, 58% of panelists were from underrepresented minority groups.

GRF Recipients—Who Applies and Who Becomes an NSF Fellow?

Table 2 shows application and award data for selected years for the Graduate Fellowship competition of the GRF program, and Table 3 provides similar data for the Minority Graduate Fellowship competition, which began in 1978 and terminated in 1998. The number of applicants to the GRF program has fluctuated quite widely over the almost five decades of its history. The success rate, or percentage of GF applicants receiving awards, has averaged 15.3%. The average success rate for applicants to the MGF competition has been 12.9%.

Table 2

Applications and Awards in Selected Years: GF Competition

| Year | Number of applications | Number of new awards | Success Rate | Comments |
|------|------------------------|----------------------|--------------|--|
| 1952 | 2685 | 569 | 21.2% | First year of program |
| 1962 | 4977 | 987 | 19.8% | |
| 1972 | 5005 | 550 | 11.0% | First year of new administrative procedure whereby fellows did not need to reapply each year |
| 1982 | 2672 | 500 | 18.7% | Lowest number of applicants |
| 1992 | 7723 | 740 | 9.6% | Highest number of applicants |
| 1998 | 4851 | 766 | 15.8% | |
| 1999 | 4796 | 900 | 18.8% | Most recent year |

Table 3

Applications and Awards in Selected Years: MGF Competition

| Year | Number of applications | Number of new awards | Success Rate | Comments |
|------|------------------------|----------------------|--------------|------------------------------|
| 1978 | 72 | 43 | 58.0% | Program initiated |
| 1979 | 520 | 65 | 12.5% | First full year of program |
| 1992 | 1480 | 120 | 8.1% | Highest number of applicants |
| 1998 | 720 | 134 | 18.6% | Last year of program |

The number and characteristics of applications has changed over the history of the program (Tables G2 and G3). The percentage of all GRF applications from women has increased, as has the percentage of applications from underrepresented minorities. Women are less likely to be white and more likely to be African American than men who apply. The percentage of applications from individuals in all groups receiving bachelor's degrees from research (RU1) universities has increased substantially over the 15-year period. This percentage remained somewhat lower for applications to the MGF competition compared to the GF competition (Table G2), and for women compared to men (Table G3). Quantitative GRE scores for applications from women and for MGF competition applications increased significantly, as did Verbal GRE scores for MGF applications, from 1979 to 1993.

Application patterns by discipline have also changed over time. By 1993, almost as many applicants to the GF competition were applying in Engineering as the Life Sciences. In the MGF competition, applicants to Engineering exceeded those to other discipline groupings except the Social and Behavioral Sciences. The percentage applying to Math/Computer Science/Physical Science in the MGF competition doubled to 12%. The discipline grouping attracting the largest percentage of applications from women continued to be Life Sciences, although this is down from 1979. The percentage of applications from women in Engineering increased almost four-fold, from 5% to 19%. Among men, the most popular discipline by 1993 was Engineering. The largest decreases in applications are seen in the Physical Sciences and Life Sciences.

Overall trends in GRF recipients from 1979 to 1993 are similar to those of applications, with regard to gender and race/ethnicity:

- The percentage of women among GRF fellows has increased, from 29% to 43%. One quarter of the 1993 women fellows were WENG recipients, accounting for 40% of this increase.
- The percentage of Caucasian, non-Hispanics receiving GF fellowships has declined, from 90% to 71%, showing increased diversity.

Over time, there have been changes in the disciplines chosen by fellows, with an increase in the percentage of engineers among GF fellows and a decrease in the percentage of biological/life scientists by 1993. Further, the dominance of Engineering is more pronounced among MGF fellows and women fellows of all races, with 34% of MGF fellows and 33% of women fellows in Engineering, as compared to 30% of white male fellows. The introduction of Women in Engineering awards to the GRF program influenced this outcome.

GRF fellows have higher average GRE scores than do applicants. In addition, there have been increases in scores for MGF fellows since 1979. GRF fellows' GRE scores overall have decreased moderately in most discipline areas but remain high. Both Disciplinary fellows (200 respondents) and their program peers (188 respondents) answering the survey have high GRE

scores. Average quantitative scores are close, ranging from 737 for peers in Biochemistry to 787 for fellows in Mathematics. GRF fellows have consistently higher average verbal scores (means for four disciplines of 653-694 compared to 566-633) and analytical scores (735-766 compared to 682-720) than peers have (Table G2).

We found that differential success rates by type of undergraduate institution are quite consistent over time, and similar for GF and MGF applicants for 1984-1988 and 1989-1993 cohorts. About 17% of RU1 applicants become fellows (both GF and MGF), compared to about 5% of GF and MGF applicants from non-research institutions (Tables G4.1 and G4.2). However, a much larger percentage of applicants to the MGF competition graduated from non-research institutions (38%) than did applicants to the GF competition (16%), which corresponds to lower overall award rates for 1984-1993 MGF applicants. This reflects their undergraduate academic experience, which is more likely to be at non-RU1 institutions where access to undergraduate research experience is limited. Since the research proposal component of the NSF application carries considerable weight in the review process, it is not surprising that applicants from non-research institutions are less successful in winning NSF fellowships. Thus, the GRF selection process continues the sorting out process that begins at the undergraduate level (Owings, Madigan, & Daniel, 1998).

Declining the GRF

Fifteen respondents among the Disciplinary peers had been awarded an NSF fellowship but declined it. Nine cited receiving an alternative award that carried a better stipend, and seven also cited an alternative that carried additional funding beyond the stipend. Three peers interviewed during the site visits declined the GRF:

Accepted a Ford Foundation Fellowship instead for the stipend but now thinks this was a mistake and is reapplying for the GRF with the intention of deferring Ford if successful. (D-EC)

Accepted the Department of Defense National Defense Engineering and Science Fellowship for its higher stipend. (D-M)

Accepted the Howard Hughes Medical Institute Fellowship because it is longer, has higher stipend, and includes meetings for fellows. (C-BIO)

Enrollment Choices of Students

We found that both NSF fellows and their peers decided to enroll in a graduate program based on many factors, and financial support was not necessarily the most important. This is especially true in programs where all Ph.D. students are fully supported. Student preference was for an RU1 institution and a graduate program and faculty with outstanding reputations in their research area. Given acceptance at roughly equivalent graduate programs, other factors became important to many, including perceptions of a supportive environment, financial support, location, and weather.

Two fellows mentioned choosing [Institution B] because they were recruited heavily...and both of these were encouraged to become doctoral students. Location and reputation also influenced enrollment choices. One student also mentioned that she wanted to be at a state university with a strong research program. (B)

According to the vice-chair, factors that influence student choice include west coast/east coast preferences and the "style" of the department. He noted that [Institution D] is more business-like and has better facilities, but [Institution A] is more personal. (A-ME)

Fellows and peers made their choices for similar reasons: program, faculty, location, weather. [Institution D] benefits from the "sunshine and palm trees" factor. (D)

Students chose the [Institution E] Biochemistry program for various reasons related both to the program itself and also to personal lifestyle choice. While students consistently made remarks such as "the program here is excellent," several also stated that they chose the program for its geographic location or for personal reasons (e.g., "I like the more laid back lifestyle" or "My husband was already working here so it made sense to come here"). (E-BIO)

All students in this department receive equal funding. They were not influenced by financial support in their enrollment choices. (C-BIO)

For many applicants, campus visits are important in determining their enrollment preferences. We heard accounts during the site visits of how this direct interaction with faculty and students in a program influenced enrollment choice.

Two fellows mentioned choosing [Institution B] because they were recruited heavily- "the graduate advisor is amazing" and both of these were encouraged to become doctoral students. (B)

And another peer also chose [Institution A] because future support seemed less likely at [Institution D] although the friendly, personal style of the [Institution A] faculty during his campus visit was also a factor. (A-ME)

Among the advantages [Institution D] has in attracting top graduate students, "location and weather" rank high in addition to the good program and feeling welcome on visitor's day compared to the reception at other universities, according to a faculty member. (D-ME)

From our survey of 1989-1993 NSF fellows and Disciplinary peers we learned more about the attendance patterns of fellows, including the type of degree program that they chose to enroll in. Not all NSF fellows enter graduate school with the intention of pursuing doctoral degrees. The important role of the master's degree in the discipline of Mechanical Engineering is clearly seen from Table 4. Whereas 83%-97% of Disciplinary fellows in the other three fields were seeking doctorates, only 74% of Disciplinary fellows in Mechanical Engineering and 73% of WENG fellows were pursuing a doctorate. Almost one-third of MGF fellows reported seeking the

master's degree. Fellowship support for graduate study in disciplines where a master's degree has value for starting research careers and is the degree of choice for one-fourth to one-third of students requires a different measure of success. Assessment of NSF fellows' success needs to take these differential degree goals into account by looking beyond Ph.D. completion rates for evidence of success. For example, securing a research position in industry or teaching at a community college or high school in a SMET field with a master's degree should be considered positive outcomes. Similarly, a decision to pursue an MBA, JD, or MD degree program should not be seen as failure but as a matter of choice.

Table 4
Degree Sought by Survey Respondents

| Respondent Group | Percent seeking master's | Percent seeking doctorate |
|------------------------|--------------------------|---------------------------|
| Disciplinary Peers | 8% | 86% |
| Mechanical Engineering | 27% | 68% |
| Mathematics | 6% | 90% |
| Biochemistry | | 92% |
| Economics | 2% | 91% |
| Disciplinary Fellows | 8% | 88% |
| Mechanical Engineering | 22% | 74% |
| Mathematics | 2% | 96% |
| Biochemistry | 3% | 83% |
| Economics | 2% | 97% |
| WENG Fellows | 18%* | 73%* |
| MGF Fellows | 15% | 75% |
| Mechanical Engineering | 32% | 59% |
| Mathematics | 8% | 77% |
| Biochemistry | | 88% |
| Economics | | 94% |

* Percentages do not add to 100% because 1 Disciplinary Peer and 1 WENG respondent gave MBA as their reference degree sought, and 9 Disciplinary Peers, 8 Disciplinary Fellows, 6 WENG, and 8 MGF respondents gave a professional degree.

Secondary data analysis (CI)¹⁰ reveals that most NSF fellows chose to enroll in a small number of institutions. For the most recent cohort studied (1989-1993), GF fellows (94%) and MGF fellows (91%) enrolled primarily in RU1 universities. For MGF fellows, this represents a 14 percentage point increase over the first cohort (1979-1983). From 1979-1993, more than half of GF fellows in the Engineering/Math/Physical Sciences (EMP) disciplines enrolled in just five institutions. In EMP and Social and Behavioral Science, more than two-thirds of GF fellows enrolled in one of 10 institutions. GF fellows in Biological and Life Sciences were the least highly concentrated, but still more than half of them enrolled in just 10 institutions. MGF fellows were somewhat less concentrated in their first 10 institutions than were GF fellows (Tables G5 and G6).

¹⁰ The CI contains data on anticipated institution of enrollment. We compared CI data for 1989-1993 with NSF's internal database that contains actual institution of enrollment. While only 75% attended their anticipated institution, there was no effect on which institutions were among the top 10 destinations of fellows.

There are 88 institutions with an RU1 classification in the United States (Carnegie Foundation, 1994). Quality characteristics of graduate programs vary considerably within this group of institutions and may also vary within an individual institution. Although there is no nationally available metric to measure overall institutional reputation in graduate education, the reputation of a graduate program as being of high quality is understood among scholars and practitioners in individual disciplines and is reflected in the National Research Council (NRC) ratings. The reputational quality ratings from the NRC study (National Research Council, 1995) provide a tool to assess the types of programs in which NSF fellows are enrolling. The NRC rates graduate programs as Distinguished, Strong, Good, Adequate/Marginal, and Not Ranked. Since programs rated by the NRC are not defined in the same way as those in the GRF Program, we used less direct methods for assessing the reputational quality of programs in which GRF fellows enroll, using disciplinary area indices derived from NRC program ratings (Webster & Skinner, 1996).

Of NSF fellows who completed the Ph.D., about 90% received degrees from doctoral programs rated either Distinguished or Strong. This percentage has remained consistent over the 15-year period 1979-1993, increasing just one percentage point from earliest to most recent cohort. For the 1989-1993 cohort, women remained less likely to complete degrees from a Distinguished program than men (56% versus 62%). While 90% of GF and 78% of MGF doctoral graduates in the most recent cohort completed degrees from Distinguished or Strong programs, less than half of MGF graduates completed degrees from Distinguished programs (48%) compared to 62% of GF fellows. MGF doctoral completers were also more than twice as likely as GF completers to graduate from programs in the categories of Good, Adequate/Marginal, or Not Ranked. Generally, however, NSF fellows continued to enroll in highly regarded graduate programs, and three of five NSF fellows who completed degrees did so in Distinguished programs.