

Project Summary

The overarching goal of the Institutional Transformation Award Program proposed for Brown is to increase the level of opportunity for faculty and implement mechanisms to protect and nurture faculty success. We would like to develop transparent formal programs to provide the ingredients for success often available informally, to guarantee access for women faculty. This will ensure that once recruited women faculty will have a working environment that will allow them to achieve their full potential and ultimately assume positions of power. The ADVANCE program at Brown will include: 1) a leadership program for women science faculty that will help them to develop peer networks and assume leadership positions, 2) a faculty development program for all faculty part of which will be a mentoring program designed to create a cadre of faculty informed about gender equity issues, 3) a department chair leadership program aimed at improving departmental climate and making departmental policies fair and transparent, and 4) a visiting scholar program that will allow us to bring in experts to help us design model programs for the above.

Broader Impacts We would like to demonstrate that providing access to formal transparent faculty development programs ameliorates the problems of hidden bias and evens the playing field between male and female faculty. Moreover, we hope to demonstrate to Academic Administrators, at Brown and elsewhere, that investing in faculty pays off in reduced attrition and increased grant dollars. We expect our program to have the following specific outcomes: 1) reduce faculty attrition, including attrition of women and minority faculty; 2) increase the number of women promoted to full professor; 3) decrease the time in rank of associate professors; 4) increase the number of women rising to leadership positions in either academic administration or areas of scholarly leadership; 5) prevent mid-career burnout by encouraging collaborative projects and brokering opportunities for science faculty to become involved in such projects; 6) increase the amount of funded research by providing appropriate support for faculty submitting proposals. All of these potential outcomes will provide a return on investment for academic institutions.

Scientific Merit Collecting indicator data for the proposed program and disseminating it to the community will represent a significant contribution to understanding the barriers that inhibit the advancement of women scientists.

Program Overview The goal of transforming academic institutions into places where women faculty can succeed as full professors, leaders in faculty governance, or administrators, requires change at multiple emergent levels throughout the institution. We assert the common ingredient required at each of these levels is a change in the mind-set of administrators where faculty are treated as valued investments and given the resources that they need to succeed through formal, transparent programs that do not require tacit knowledge for access.

The cost of hiring a new faculty member, particularly in a scientific discipline, is enormous. In addition to the typical search costs such as travel expenses to bring in candidates for interviews, or startup funds to set up a new lab or in some cases renovating lab space, there is the additional cost of the time that it takes to complete the search process. The time spent by search committee members reviewing applications, department members listening to seminars and talking to candidates, the department chair and other upper level administrators in interviews with the candidates, all represent a cost. This is usually considered to be time well spent if it results in a valued colleague who is productive and gets promoted.

However, little attention is paid to nurturing or protecting the investment once it has been made. Administrators generally assume that if they hire well qualified faculty, those individuals will succeed on their own with little help and in many cases this strategy works quite well because people with Ph.D.s tend to be very self-reliant. In general, those individuals who hold powerful positions within an academic institution (Department Chairs, and other Administrators) were able to succeed under such an informal system of faculty development. But this strategy does not always work. Assistant professors who look extremely promising during their interview often fail to get tenure for no explicable reason. When a talented faculty member's career suddenly stalls at the associate professor level after a productive period as an assistant professor, they are referred to as dead-wood and forgotten about. At most academic institutions, little is done to reduce the likelihood of these outcomes. This is primarily because Department Chairs, Deans, and other administrators all managed to be successful themselves within the current system.

Many of the resources that faculty require to succeed in their academic careers are available informally. Often personal relationships within an academic department can provide a faculty member with access to informal mentoring by senior colleagues, financial resources to attend conferences or bring in speakers, invitations to participate in collaborative interdisciplinary research proposals, etc. One of the reasons that men find it easier to succeed in Academia is such informal resources are often more accessible to them either because of subtle biases that are extremely difficult to measure (Valian, 1998) or because women simply do not have the tacit knowledge that would allow them access because they are in minority or token positions. We assert that the barrier created by unequal access is an institutional problem that can be remedied.

The overarching goal of this Institutional Transformation Award Program is to increase the level of opportunity for faculty and implement mechanisms to protect and nurture faculty success. We would like to institute transparent formal programs to provide the ingredients for success often available informally, to insure access for women faculty. Our ultimate goal is not simply to recruit more female faculty, or increase the rate at which they achieve tenure, but it is to ensure

that once recruited they have a working environment that will allow them to achieve their full potential and ultimately assume positions of power.

Current Status of Women at Brown After a tumultuous history Brown is now a leader among its peers in recruiting and granting tenure to women faculty. The fact that we do not need to overcome that initial obstacle with this proposal will allow our focus to be on problems for women at mid-career or women trying to ascend to the highest levels in academia.

In 1977, Brown's faculty hiring and promotions policies were subjected to a court approved Consent Decree. One of the requirements under the Decree was the establishment of a faculty committee charged with overseeing the hiring, tenure and promotion processes to insure that all candidates, especially women were treated equitably and fairly. Under the Consent Decree, Brown also established policies of equal employment opportunity and affirmative action. The Decree was in operation through 1991 when it was terminated with the full support of the women faculty at Brown. In that time period, the total number of women on the Brown faculty grew from 12% to over 20% and the number of tenured women increased from 2% to nearly 12%.

With the termination of the Consent Decree, the committee charged to oversee all new faculty hiring and promotion became a standing committee of the faculty. The committee continued to monitor faculty hiring and promotion processes with assistance from the newly established Office of Equal Employment Opportunity and Affirmative Action. A second standing committee charged with monitoring climate issues for women at Brown was also established. The new standing committee was responsible for monitoring such issues as gender equity in salaries and policies like maternity and family leave.

Over the next decade, the proportion of women on the faculty at Brown University continued to grow. By 2001, the representation of women on the total faculty had grown to 28% and nearly 20% of all tenured faculty members were women. In 2003, President Ruth J. Simmons created the Office of Institutional Diversity (OID) to provide leadership for the formulation and oversight of policies related to pluralism and equity, and initiate programs and practices that promote diversity, inclusion and fair treatment of all members of the community. The work in OID is led by the associate provost and director of institutional diversity.

A central charge of the OID is to continue to build diversity among the faculty at Brown. The associate provost and director of institutional diversity assumed the role of the faculty committee created during the Consent Decree. The OID was made an integral feature of the faculty hiring process. Every department undertaking a faculty search is required to partner with the OID in order to assure that the most active and aggressive measures are taken to identify and attract diverse applicant pools, and any search waiver for a faculty position must be approved by the director. All short lists for campus interviews are approved by the director of institutional diversity and she is a signature on all final requests to hire. The Associate Provost and Director of Institutional Diversity is also a member of the two standing committees created to monitor the hiring, promotion and climate issues for women at Brown. With the addition of the associate

provost, the charges of these committees have been slightly revised, however, the input of these committees remain vital to the goal of gender equity at Brown.

As Brown is also in the process of expanding the size of its faculty, the availability of new positions and flexible recruitment strategies through a target of opportunity program further enhances diversity recruitment efforts. Chairs and directors work with the OID to develop target of opportunity proposals and to construct recruitment strategies for pursuing the targeted hires. Over the past three years, the faculty at Brown has grown by 51 new positions (8.8%). ***Fifty-one percent of the incremental hires have been women and minorities.*** Currently women represent 30% of the total faculty. Yet 34% of the incremental hires have been women. Similarly, minorities represent about 16% of the current faculty at Brown, but 27% of the incremental hires have been from underrepresented groups. Minority women represent 10% of the incremental hires as compared to 5% of the current total faculty.

The overall growth of women on the faculty at Brown has been impressive. Throughout the last decade, Brown has been a leader among its peers in the recruitment and retention of women faculty members. Moreover, 66% of all the women hired at Brown as assistant professors since 1985 have gone on to receive tenure. This is compared to an overall average of 67% for the University. Since 1995, 87% of the women and 92% of the men who stand for review have been granted tenure. Nearly one half of the faculty members in the humanities are women and 30% of social science faculty are female. In the sciences, women represent 36% of the faculty in the life sciences, but only 9% of those in the physical sciences. The disproportionately low representation of women faculty in the physical sciences at Brown is lower than the national average (7.2% of Brown Physical Science faculty are female vs. national average of 15%). However in computer Science we are close to the national average (12% at Brown, 13% is the national average) and the college of engineering has a higher percentage of women than the national average (14% at Brown vs. 7% nationally).

Dept./College	#M	#F	% F
Applied math	20	1	5%
Chemistry	18	0	0%
Computer Science	22	3	12%
Geology	17	3	15%
Mathematics	22	3	12%
Physics	23	1	4%
Engineering	36	6	14%

The Target of Opportunity Program at Brown has had some success in attracting women and minorities to the science faculty. The program has been used to bring one senior woman and one minority male to the Computer Science Department. The Physics department has also been extended the opportunity to pursue a woman hire. A more recent proposal has been developed to specifically earmark more of the positions available under the Target of Opportunity Program to further pursue the goal of hiring more women in the physical sciences, computer science and engineering. Over the next three to five years, 6 new target of opportunity hires will be made available to recruit women faculty to the physical sciences, computer science and engineering (see letter of support from Provost Zimmer). These six incremental positions will greatly

complement efforts made during the regular hiring process to attract and recruit women to positions opened up through retirements and other departures.

Current Barriers to Advancement at Brown

Faculty hiring processes and procedures at Brown are built upon best practices for diversifying the faculty (Moody, 2004; Smith, 1996; Turner, 2002). The hiring process begins with the clear articulation of the importance of diversity for academic excellence. This view is espoused from the highest levels of the administration and the OID was created to foster alignment between departmental goals and the institutional value of diversity. Substantial resources have been committed to support diversity in recruitment including monetary sources for targeted positions, start-up cost and extra outreach, as well as human resources in the form of assistance to departments for more active and aggressive recruitment. The OID was also created to provide greater expertise to departments when thinking about faculty searches. The literature has taught us much about the need to help search committees confront myths (see Moody, 2004 and Smith, 1996); think through the significance of wording in advertisements (see Turner, 2002) in addition to the need to provide expert advice about effective campus visits and strategies for successful negotiation. The ever increasing numbers of women and minorities on the faculty at Brown reflects the success of these strategies and careful analysis each year yields new recommendations for how Brown can do things better. Plans to focus increased resources on the recruitment of women in the physical sciences, as well as continued efforts to identify more targeted opportunities to hire minorities, especially minority women are just two examples of how Brown uses its hiring data to plan more strategically.

In 2003 Brown participated in a Tenure-Track Faculty Job Satisfaction Survey of junior faculty conducted by Cathy Trower at The Study of New Scholars, Harvard Graduate School of Education. The survey results suggest that in general faculty at Brown are very satisfied with their institution as a workplace. However, the study also pointed out several areas for improvement that were indicated in the Executive Summary. The areas for improvement included the need for 1) formal mentoring, 2) professional assistance in obtaining funded grants, and 3) financial assistance with childcare. Although the majority of both male and female faculty said that they would find these helpful, in all three of these categories female faculty were significantly more likely than male faculty to report that they would find these services helpful. Female faculty were also more likely to indicate that they would find travel funds to present papers or conduct research helpful. A possible explanation for the difference between responses from men and women is that male faculty might feel that some of these resources are already available to them informally.

How helpful would you find:	Female			Male		
	UH	SH	VH	UH	SH	VH
formal mentoring	6%	39%	56%	8%	53%	39%
assistance in obtaining federally funded grants	0%	31%	69%	10%	31%	59%
travel funds to present papers or conduct research	0%	11%	89%	10%	23%	68%

UH = unhelpful, SH=somewhat helpful, VH=very helpful

Similar recommendations have come forth from a newly established faculty committee advising the Dean of the Faculty that has been charged with identifying the major development needs of the faculty. Through committee discussions, survey of opinions from department chairs and program directors, and solicitation of ideas from a cross-section of faculty members, several initial ideas for areas of faculty development have emerged.

In a survey of the chairs, the committee learned that many untenured faculty members seek mentoring and that senior faculty members are willing to mentor. The board also learned that the need for mentoring at Brown is not restricted to untenured faculty members. Indeed, there appears to be an even greater need to develop a set of opportunities designed to help mid-career members of the faculty regain their scholarly momentum after the tenure process. This point is bolstered by the fact that on average, *women remain in rank after tenure and promotion nearly three years longer than men*. Some suggestions for why this may be the case and ideas for improving the trend are outlined in a book by Tierney and Bemsimon (1996). They persuasively argue that current practices by departments especially in the case of tenure and promotion procedures favor the majority and males in particular.

Conceptual framework

In her classic work, *Men and Women of the Corporation* (1975), Rosabeth Moss Kanter lists characteristics of people in situations that are low in opportunity. These characteristics include having a horizontal orientation, comparing oneself with peers; being critical of or failing to identify with, people in management positions; being unlikely to protest directly or seek change; discouraging members of the group from seeking mobility, and being more attached to the local unit than to the larger organization. Although Kanter was referring to employees low in the corporate hierarchy, such as secretaries and office workers, the same qualities are often true of University Faculty. Being a faculty member is clearly far more intellectually stimulating than the positions that Kanter describes and, as a result, all of her generalizations do not apply. However, the ones that do are good descriptors of people who find themselves in positions where there is little opportunity for upward mobility or where the time between promotions is lengthy.

Kanter asserts that one of the explanations for women not ascending to the highest levels of leadership is because they often start off in low-opportunity positions. University faculty generally only have the opportunity for two promotions throughout their entire careers. Thus, without opportunities that are either generated by the faculty themselves or brokered by the institutions, academic positions are low in opportunity. Studies of faculty productivity have demonstrated a relationship between low productivity and lack of organizational opportunity (Blande and Bergquist, 1997; Boice, 1986, 1992, 1993). Both vital productive faculty and less productive faculty go through periods where they “get stuck” in their careers. Whether faculty manage to get “unstuck” generally depends on whether they are able to create their own new opportunities.

It has been suggested that institutions can take a proactive role in creating or brokering opportunities for faculty (Blande and Bergquist, 1997; Blande et al. 2005) as a mechanism of preventing or overcoming mid or late career burnout. Institutions can enhance faculty productivity by establishing clear coordinated goals through strong academic leadership. However, most faculty development programs are generally not offered in a coordinated way. Blande and Bergquist 1997 suggest that the impact of faculty development programs aimed at increasing or maintaining faculty productivity can be higher if programs are guided by an overall plan. It is our intention to propose such a coordinated plan for faculty development using ADVANCE funds as a mechanism of demonstrating that providing the appropriate resources and opportunities to faculty throughout their careers will not only prevent mid-career burnout but will propel faculty to achieve at the most eminent levels and assume leadership roles.

Succeeding at the very highest level of academic science means not only being awarded research grants and publishing in the best journals but also serving the scientific community in prestigious roles such as being an editor or associate editor of a journal, or being an officer of a scientific society. Accomplishments such as being nominated for and elected to the National Academy of Sciences or being awarded a MacArthur Fellowship represent an even higher level of success. All of these accomplishments necessitate having peers who respect the scholarship of the person in question. The most basic requirements of success: getting grants and publishing papers involves peer review based on merit. ***Success at higher levels requires sponsorship, the prerequisite of which is having one or more senior colleagues who value accomplishments and recognize leadership abilities.*** Although sponsorship might have its roots in scholarly achievements, it generally does not occur without specific personal knowledge that can't be gained by reading a paper or a grant proposal.

If sponsors are important for the success of male faculty, they are absolutely essential for women faculty. Moody (2004) asserts that there is indisputable evidence that minority and women faculty do not receive their proportionate share of sponsorship from senior faculty (see Turner and Meyers, 2000; Gainen and Boice, 1993). In fact, women faculty often experience informal isolation. Interventions such as formal programs that assign mentors and the proactive guidance of department chairs are necessary to insure that minority faculty receive the same benefits that majority faculty receive.

One of the programs that we propose is aimed at increasing exposure to senior women colleagues that can serve as role models and sponsors (see Luna and Cullen, 1995; Moore, 1984). It is our intention that these programs will provoke some of the benefits of a critical mass even before such a goal is reached. The legal team leading the defense of the affirmative action lawsuit against the University of Michigan Law School argued that attaining a critical mass of individuals who share common social characteristics is important for creating an environment where a diversity of individuals can thrive. A critical mass can have this effect primarily because the significant presence of the "other" is an effective means for breaking through stereotypes. When there are only a few women or a few people of color in a setting, those individuals are more aware of themselves in that environment and thus are less likely to present viewpoints and ideas in opposition to the dominant culture. When minorities and women are present in greater numbers, the minority having a view is no longer the "minority view." Those in the minority feel much more free to express their individual points of views and those around them come to see the diversity of opinion reflected in those views. Hence, the concept of a critical mass helps all benefit from the diversity present.

The lack of a critical mass of women in many science departments has been linked to feelings of isolation for the women present (Moody, 2004). The lack of gender diversity in the sciences is also related to lack of persistence by female students who start out in the pipeline (see Fox, 1995). Ironically, the disproportionately low number of women in the pipeline in some areas of the sciences is the major challenge to the speed at which critical masses can be built. Thus, we propose a program designed to, among other things, import the benefits of a critical mass while building towards that goal. Moody (2004) describes one such program at Smith College. The Connection Fund, as it is called provides resources for junior faculty members to invite to campus senior scholars in their area of research. The effect of the program is two-fold. First, the junior faculty member can use the opportunity to build a network of mentors outside of the campus environment. Secondly, the department is provided the opportunity to familiarize themselves with the research of the junior faculty member through the lenses of a senior colleague.

Although isolation is arguably the major issue facing women at the academic level (Emmett, 1993; Etzkowitz et al., 1994; Rabe, 1999; Etzkowitz et al., 2000) attaining a critical mass only partially resolves the problem of isolation for women. Etzkowitz et al. (2000) suggest that social capital that is produced by the "web of contacts and relationships that provide information, validation, and encouragement" are essential for success (see Coleman, 1988; Seashore et al. 1989). They also argue that social ties among scientists in the academic community stimulate scientific innovation. "Exclusion from a network of social ties and critical mass contributes to the well-documented decline in the proportion of women who make it to each succeeding rung on the professional career ladder" (see Burt, 1997; Burt, 1998).

With an increased emphasis on interdisciplinary science, social networks become even more important if women are to succeed in the new world order. Because social capital grows in a non-linear fashion, senior scientists have a substantially greater degree of social capital (Etzkowitz, 2000). Thus, creating opportunities for women to meet senior colleagues with a

higher degree of social capital could significantly affect their ability to participate in new collaborations or provide them with sponsorship. Such senior colleagues, whether they are potential collaborators (male or female) or senior women who can provide informal mentoring, are generally not going to be present at the same institutions. ***Providing funding for individual faculty women to develop peer networks, nationally or internationally, could greatly enhance their social capital and increase their access to opportunity.***

Vision, Goals and Anticipated Impact

Solving the problem of gender inequity in Academia requires not just critical mass but a shift in power. Etzkowitz, et al. (2000) argues that a modest increase in the number of women in science alone is not sufficient to improve conditions. The key to change lies in “the support of persons in structural positions of power, or attainment of such positions by members of the minority group”. Many academic institutions remain places where it is difficult for women and minority faculty to succeed in spite of significant efforts to recruit a diverse faculty because they have traditionally served the interests of white male faculty (Henry and Nixon 1994; Margolis and Romero, 1998; Sander and Mellow, 1990). Until there are enough women with status in positions of leadership, both within the scientific community and at the highest levels of academic administration, this will continue to be true (Gebbie et al., 2002). The primary focus of our ADVANCE program is to transform Brown into a place that encourages and prepares women to assume positions of both administrative leadership and scholarly scientific leadership.

The overall vision of the ADVANCE Program at Brown is to increase the level of opportunity for faculty at Brown to allow them to succeed at the very highest levels. We assert that providing access to formal transparent faculty development programs will even the playing field between men and women in academia. Some of our programs are intended to improve the climate and level of support for all faculty to create a cadre of individuals that are informed about the importance of gender equity. Other programs are targeted specifically at women science faculty to increase their opportunities to assume leadership roles. These programs will also address the problem at Brown of women sitting in rank at the associate professor level longer than their male colleagues. The overall theme uniting the proposed programs is increasing the level of opportunity for faculty. The special emphasis on increasing social capital, leadership and the proposed programs to facilitate and encourage women taking leadership roles is clearly innovative.

We also plan to implement programs that are based on best practices developed at other ADVANCE institutions. Previous work at other ADVANCE institutions has demonstrated that Department Chair training is an essential part of institutional transformation. It has also been shown that a peer-mentoring program for all faculty that includes training in gender equity for the mentors can help cultivate a cadre of informed colleagues. ***Our own variations of these programs will be developed around our theme of increasing opportunity for faculty. Our Department Chair mentoring program will include training on how Department Chairs can broker opportunities for faculty success.*** This will include topics such as how to nurture young faculty, how to promote successful faculty and advertise their success, recognizing and

preventing mid-career burnout that might result from the lack of new or different challenges, encouraging interdisciplinary research and facilitating collaborations among departments.

Increasing opportunity and facilitating collaboration will also be part of the plan at a higher administrative level. Until recently Brown had no administrative unit devoted to encouraging research or supporting research expansion. The office of the Vice President for Research was created 3 years ago as part of the Plan for Academic Enrichment. It is the mission of the office of the Vice President for Research, and in particular the Assistant Vice President for Research (the PI of this proposal) to increase collaborative and interdisciplinary research at Brown. We will create mechanisms for initiating such opportunities for faculty while providing new support for preparing large collaborative proposals and developing grantsmanship skills. These programs are not intended to fix broken faculty but to transform Brown into a place that provides an environment rich in opportunity where faculty will be motivated to succeed. This will address the finding in the Study of New Scholars that women faculty feel that they would find such a program helpful.

We would like to demonstrate that providing access to formal transparent faculty development programs evens the playing field between male and female faculty. Moreover, we hope to demonstrate to academic administrators, at Brown and elsewhere, that investing in faculty pays off in reduced attrition and increased grant dollars. We expect our program to have the following specific outcomes: 1) reduce faculty attrition, including attrition of women and minority faculty; 2) increase the number of women promoted to full professor; 3) decrease the time in rank of associate professors; 4) increase the number of women rising to leadership positions in either academic administration or areas of scholarly leadership; 5) prevent mid-career burnout by encouraging collaborative projects and brokering opportunities for science faculty to become involved in such projects; 6) Increase the amount of funded research by providing appropriate support for faculty submitting proposals. All of these potential outcomes will provide a return on investment for academic institutions. We predict that if we demonstrate that investing in increased opportunities for faculty produces a ROI, this result will encourage other institutions to implement similar programs.

The Proposed ADVANCE Program at Brown

A. Leadership Program for Women Science Faculty The leadership program will provide several different mechanisms of support to encourage women faculty who are interested in pushing their careers to the next level by becoming academic administrators or assuming some role of scholarly scientific leadership in the national community. The program will include the opportunity to apply for 1) career development awards to cultivate peer networks, 2) awards to develop leadership in a scientific arena, 3) an administrator shadowing program, and 4) funds for faculty to attend external national programs for administrator training or leadership workshops. Faculty can apply for more than one of these four programs and will be encouraged to combine efforts as part of a comprehensive plan to enhance their careers. The primary targets of the leadership program are tenured faculty but Assistant Professors are eligible to apply and will be particularly encouraged to apply for the career development awards to cultivate peer networks.

Career Development Awards to Cultivate Peer Networks Career development awards are intended for women faculty who want to develop a proactive plan for taking their scholarly careers to the next level. It is our intention that these funds be used to *model a culture of high achievement and allow women to make connections and accrue social capital that could result in sponsorship*. The program will provide funding to faculty to allow them to create their own peer networks. Faculty can use funds to bring in a series of 3-5 speakers (ADVANCE Distinguished Speakers) who are impressive scholars within that faculty member's field. Faculty applying for career development awards will be required to propose a plan for bringing in speakers who might be potential collaborators or who could serve as informal mentors and provide advice about career trajectories. Although invited speakers can be male or female scientists, it is expected that some of the invitees should be women holding powerful positions within the scientific community such as National Academy members, journal editors, etc. The ADVANCE Distinguished Speakers will be provided with travel expenses and a generous honorarium. Career development funds can also be used for the faculty member to travel to scientific meetings or meet with colleagues if it is justified in the context of developing peer networks. These awards will be particularly beneficial to women in departments where they might be the only female faculty member or where there are very few women faculty. This will give these women the opportunity to interact with other extraordinarily successful women and it will provide their male colleagues with examples of high-achieving women within their own field. *We expect the career development awards to be particularly critical for minority women faculty* or women who might be the only woman in their departments. The need to ameliorate the problem of isolation for these women will be taken into consideration when reviewing applications for this program.

Awards to Develop Scientific leadership The awards to develop scientific leadership will provide support for women who would like to assume some significant leadership role in their own scientific community. A few examples of leadership roles include becoming president, vice president, or editor for a scientific society. The program will provide support for teaching release time appropriate to the level of commitment to give the faculty member the time to take on the additional responsibility without jeopardizing their ongoing research.

Administrator Shadowing Program This program is intended to give faculty who might be interested in pursuing an administrative career an opportunity to discover what it is like to be in a high level administrative position. Brown administrators will be asked to participate in the program when they have a special project that a program participant could coordinate. Brown faculty who are interested in the program will be paired with a Brown administrator to shadow and/or work on a special project. The program will provide support for teaching release time to allow time for shadowing.

Leadership Support Fund The leadership support fund will provide faculty with the means to attend administrator training programs that are provided by other institutions. **Leadership Workshop series** We will develop a series of workshops at Brown for all faculty who are interested in assuming leadership roles.

B. Faculty Development Programs All aspects of the faculty development program are available to and designed to improve the lives of all faculty, not just women faculty. The Tenure-Track Faculty Job Satisfaction Survey conducted by Cathy Trower at The Study of New Scholars, Harvard Graduate School of Education identified these as programs that Junior faculty would find helpful (see above). Female faculty were more likely than male faculty to indicate that they would find these programs helpful. Thus, it is possible that women could benefit disproportionately. However, it is our view that women do not need “fixing”. All faculty will benefit from fair transparent access to supportive resources.

Mentoring program The objective of the mentoring program is to provide assistant professors, if they so desire, with a mentor from outside of their department. The mentor will be someone with whom they can share their concerns and speak candidly. Tenured faculty who wish to volunteer to be mentors will be trained on gender equity issues as well as other potential areas of concern prior to becoming mentors. This program will provide faculty with a neutral outsider who will not be voting on them at tenure time. Mentoring is something that other ADVANCE institutions are already doing extremely well. Our plan is to bring in one or more individuals from another ADVANCE institution as a visiting scholar to help us develop our peer mentoring program.

Sponsored project support The PI of this proposal is a recent addition to the Office of the Vice President of Research at Brown. As Assistant Vice President for Research Initiatives it is her job to encourage new collaborations among faculty and point out new and different opportunities that faculty might be able to take advantage of. Brown has not traditionally provided any support to enhance research or make faculty more productive in their funded research efforts. As part of our plan to increase the level of opportunity for all faculty we will initiate a pilot program to provide support for faculty who would like to improve their grantswo/manship skills. This will include hiring and training a new staff member under the AVP for Research Initiatives to provide specialized assistance for faculty engaged in all aspects of the sponsored funding life cycle. The Research Resource Specialist will work in the Office of the Vice President for Research and s/he will be proactive in creating new collaborative opportunities. We expect this service to be particularly helpful to Assistant Professors who might not yet have tacit knowledge of negotiating the funding process.

Support for work-family issues Although most faculty experience some sort of mid-career slow down after tenure, our data show that at Brown women faculty sit in the Associate Professor rank longer than male faculty. Because many women faculty begin a family just after tenure, we plan to implement a strategy for ensuring that daycare is available to any faculty member who needs it. The ADVANCE program will support a full time Faculty Development Coordinator who will 1) develop a program to manage access to daycare and babysitting services and 2) develop and manage a database of potential employers to connect trailing spouses with appropriate opportunities in the geographic area. We will also work with Brown faculty to discover what programs could be helpful to Brown faculty who are parents.

C. Transforming Academic Departments

Department Chair training The ADVANCE program will bring in a visiting scholar to help Brown develop an innovative program to train department chairs on issues including best practices for retaining women and minority faculty, managing departmental climate, recruitment, mentoring of faculty within departments, etc. A focus of the department chair training will be on mechanisms of brokering opportunities for faculty success. This will include topics such as how to nurture young faculty, how to promote successful faculty and advertise their success, preventing mid-career burnout that might result from the lack of new or different challenges, encouraging interdisciplinary research and facilitating collaborations among departments. The ADVANCE program will organize a retreat for Department Chairs as a mechanism to keep them informed and invested in university and division level programs and initiatives.

D. Visiting Scholar Program

The purpose of the visiting scholar program is to provide greater in-house consultation to chairs and directors regarding best practices for recruiting and retaining women in the sciences. Rarely do campuses have personnel who specialize in all the areas of challenge to diversity. Moreover, addressing many of these challenges requires more than a single interaction with an expert. The visiting scholars program will be used to provide short residencies to scholars and consultants who specialize in helping departments and institutions address these challenges. The residencies may be as short as a couple of days or as long as a semester. The visitors would address a variety of issues including helping chairs become more effective leaders around recruiting and retaining women in the sciences, working with departments to create mentoring programs and conducting leadership workshops for women and others. We will use the visiting scholar program to help us design programs for Department Chair training, mentor training, and other aspects of the ADVANCE program.

Program Management

ADVANCE Program Management Team The Director of the ADVANCE Program will be the PI, Pamela O'Neil, Assistant Vice President for Research Initiatives. She will lead the ADVANCE Management team, which will consist of Brenda Allen, Associate Provost and Director of Institutional Diversity; Brian Casey, Assistant Provost, Mary Fennell, Professor and Chair of Sociology; Johanna Schmitt, Professor of Biology, Tayhas Palmore, Assoc. Professor of Engineering, and a Managing Director (to be hired from a national search). This team represents a combination of administrators, scholars, and administrator-scholars. Dr. Fennell is a former Dean of the Faculty who studies the sociology of organizational change. Drs. Allen, Casey, and O'Neil all have regular access to the Provost, Robert Zimmer so that he can be kept informed regarding policies, problems and issues regarding institutionalization. Drs. Schmitt and Palmore are respected faculty with a strong record of scholarly leadership. An additional faculty member from the physical sciences will be added to the management-team. The managing director will be responsible for overseeing all of the day-to-day activities of the program and will supervise the faculty development coordinator. Some of the duties of the managing director will include planning and organizing the mentoring program, department chair training program,

visiting scholars program and managing the review of the applications for the leadership program. This will be a particularly challenging position because it involves synergistic activities across campus in consultation with the Associate Provost and Director of Institutional Diversity, Brenda Allen, the Assistant Provost Brian Casey, Deans, and Department Chairs.

Program Staff We will hire two new staff members who will work with the support staff already in place currently working for the Program management team (O'Neil, Casey, and Allen all have Executive Assistants). We will hire a Research Resource Specialist who will report directly to the ADVANCE Director and PI, Pamela O'Neil, Assistant Vice President for Research Initiatives. The Research Resource Specialist will work with faculty to provide specialized assistance in writing proposals and s/he will be proactive in creating new collaborative opportunities and coordinating interdisciplinary efforts. We will also hire a Faculty development coordinator. This is a key administrative position responsible for 1) working with the managing director to develop a program to manage access to daycare and babysitting services and 2) developing and managing a database of potential employers to connect trailing spouses with appropriate opportunities in the geographic area. The faculty development coordinator will report to the managing director and will also assist with data collection and the day-to-day administrative needs of the program.

Advisory Committees The program management team will be advised by both an internal steering committee and an external advisory committee. The internal steering committee will include representation from the Faculty Development Advisory Board, the Subcommittee on Diversity in Hiring, the Faculty Affairs Committee, and the Committee on the Status of Women.

The steering committee will meet quarterly. The composition of the external advisory committee will be determined at the time an award is made in consultation with the Program Management at NSF. This committee will meet yearly.

Plan for Sustainability and Institutionalization

“Institutionalization” refers to the end result of program survival: what remains of specially funded programs and activities beyond the funded period. This concept derives from the classic sociological work of Selznick (1952): the process by which an organization “takes on a special character,” and “achieves a distinctive competence or perhaps, a trained or built-in capacity.” Ideally, we would like to see the adoption of NSF-funded programs and activities become part of Brown’s distinctive competence: ongoing and stabilized within the budgets of various units, both within the administration of Brown, and within science and engineering departments. We have included senior administrators as part of the management team so that they can act as liaisons to the provost to negotiate plans for institutionalization. Both Brenda Allen and Brian Casey work in the provost’s office and work on special projects for the provost on a regular basis. Casey, Allen, and O’Neil will keep the Provost informed on a regular basis and discuss the results of yearly evaluations with the provost so that programs funded by ADVANCE can be added to the table of needs for which we will seek private funding as soon as it becomes clear that the programs are having a positive impact on faculty.

Program Evaluation

Near-term, long-term, and institutionalization. The planned set of programs that make up this transformational proposal involves all levels of the university: top administrators, mid-level administration, department chairs and departments, and individual faculty. The target population includes departments and faculty within the sciences and engineering, but some programs will be made available to all faculty (the mentoring program). Each program will be developed and launched within the first six to twelve months of funding. Some will ramp up quickly, others may take more than a year to become fully operational.

For the purposes of the evaluation, it is helpful to categorize goals as near-term or long term, depending upon the intended impact of each activity. Near-term goals include the development of specific programs that would improve either the work environment or the work-family interface for women faculty in sciences and engineering: mentoring, providing research proposal assistance, and improving supports for work-family issues. The short-term impact of these goals would be (for instance) to make available the assistance needed by senior women to carry the burden of family needs without incurring large costs to one's research program. Evaluation of these goals can be structured with observations to be made during the funding period, at the end of the funding period, and post-funding. These near-term goals would actually influence several long-term goals as well. The long-term impact of these programs would be to improve the promotion rate of senior women and to increase the number of women taking on leadership roles within the university and within one's discipline.

Long-term goals focus on directly improving the number and percent of women in the science and engineering fields to reach full professor rank, increasing the number of women in leadership positions within Brown, and within their disciplines, and improving departmental climate or culture. Improving department culture to be supportive of women should itself have a positive influence on the other two long-term goals. We are not likely to observe change in these numbers immediately. The numbers of women at full rank and within positions of leadership are subject to both positive and negative flows of faculty to and from full rank and leadership positions. It is likely that success on these dimensions will start to clearly improve towards the end of a 6-8 year period, the normal period of time between promotion to associate professor with tenure, and subsequent promotion to full professor. Young women scientists newly promoted to associate professor in the year before funding of this proposal would have maximum exposure to both near and long term programs of support; thus their cohort of associate professors should reach the "maximum effect" response in promotion rates to full that are comparable to men in the sciences and engineering, if these programs have their intended effect. Further, subsequent increases in the rates of women taking on leadership roles will probably not be observable until after the end of the funding period.

Process and outcome measures Standard program evaluation methods outline three major classes of measures to help assess program (and organizational) effectiveness: process, outcomes, and structures (Scott, 2003; Donabedian, 1966; Posavac and Carey, 1980). In this evaluation plan, we will focus on outcome and process measures. Process measures help answer questions concerning what work was done by the program, and how well it was done; these are

measurements of program performance itself. For example, measures of work quantity, client contacts, or efforts to diffuse information to a defined target population are all measures of program process. Outcome measures focus more specifically on end-results, or changes in the specific characteristics of the material (in this case, faculty members) on which the organization has performed some operation (such as promotion, or advancement to leadership positions).

The following table summarizes the variety of process and outcome measures we will use to evaluate both the work undertaken by this program, and what changes occur in promotion rates, and assumption of leadership roles by women faculty in the sciences and engineering.

Goals and Measures of Goal Effectiveness (some examples, not an exhaustive list)

<i>Near Term Goals:</i>	<i>Process Measures</i>	<i>Outcome Measures</i>
Implement faculty mentoring program	Program implemented by fall of 2006; advertise and contact departments; set yearly goals on numbers of faculty served.	Active mentor relationships
Provision of proposal prep expert support	Establish program by September 2006; set yearly goals on number of faculty contacts and number of faculty provided with prep support	Increased number of proposals submitted and funded
Improve support for work family issues	Launch programs to manage access to daycare; manage database on local job opps. For trailing spouses set yearly goals for number of faculty contacts made and the number of faculty served by each program.	
<i>Long Term Goals:</i>	<i>Process Measures</i>	
Increase the # and % of women in full professor rank in S/E	Increase the number of senior hires, decrease time in rank as Associate Prof	
Increase the number of women in leadership positions	Increase number of S/E women chairs, deans and directors, women appointed to named chairs, elected to office in professional associations, editorships in journals/etc., women named to national honor societies	

Data Collection

For all goals and both outcome and process measures, a baseline measurement is needed prior to the start of program activities. Most of our measurements will involve the use of either faculty career data that is already collected on a regular basis by the office of the Dean of the Faculty (promotion data, gender breakdowns by ranks, by special titles, etc.), or the office of the Vice President for Research (grant proposals submitted and funded, etc.). These sources will also provide baseline data for pre- ADVANCE levels of these measures. Many other process measures will be built into the work-scope of the projects/activities to be developed (records to be kept on faculty contacts, numbers of faculty served, etc.).

The one important exception to this concerns measures of department climate or culture. Organizational and subunit culture represent notoriously difficult concepts to both define and measure. Nonetheless, to ignore the impact of culture or climate in any analysis of professional work environments would be perilous. Smircich (1985: 58) has provided a useful definition of culture: "The term culture describes an attribute or quality internal to a group. We refer to an organizational culture or subculture. In this sense culture is a possession – a fairly stable set of taken-for-granted assumptions, shared beliefs, meanings, and values that form a kind of backdrop for action."

In our attempts to transform the culture of science and engineering departments at Brown, our goals are to improve beliefs and expectations concerning women faculty as senior scholars and leaders. We argue that the attitudes and beliefs of both women and men in these departments need to change in order to transform department climate. Of most importance are the beliefs faculty hold (especially women faculty) about their place in the department, their chances for promotion to full rank, the extent to which they are supported by their colleagues, chairs and deans, and provided the resources they need to accomplish state-of-the-art research, perceptions of the extent to which the promotion process itself is equitable and fair, and whether the requirements to reach full rank are clear to them.

We will hire an external consultant to help us develop the instrument for this evaluation, conduct the survey, and render an objective evaluation. We will chose an external evaluator whose expertise is relevant to the issues affecting the participation and advancement of women in science and engineering. We plan to survey all faculty in science and engineering departments prior to the initiation of any ADVANCE programs, repeat this survey in the middle of the funding period, and again at the end of the project. If institutionalization is successful, we hope to see this sort of climate assessment adopted by the Office of Institutional Research and repeated at regular intervals.

Plan for sharing best practices

We will use four different mechanisms for disseminating findings and sharing best practices. First, as the other ADVANCE sites have done, we will construct a web site that initially describes the program, provides a copy of the proposal, and describes how the program is coordinated at Brown. We will be conscious of the different types of users who will visit the web sites (Faculty and staff at Brown, other ADVANCE institutions, future PIs of ADVANCE proposals, NSF, etc.) in developing the site. Second, we will produce an annual report that will be distributed to the Brown community and nationally that describes the past year's activity, the upcoming activities for the next year, and reports the most exciting news or results of the program. The newsletter will be published approximately 2 months following submitting our annual report to the NSF. Third, we will disseminate findings through publication in 1) scientific and engineering journals, 2) higher education journals, 3) science policy publications, and 4) other journals the publish gender equity findings. Fourth, we will share best practices through professional technical society meetings an annual conferences of organizations such AAAS, WEPAN, and SWE.

References

- Baker, S. M. (1999). Success for Women in Academia: Choices, Experiences, and Challenges. In C. C. Selby (Ed.) *Women in science and engineering: choices for success*. Annals of the New York Academy of Sciences V 869.
- Blande and Bergquist (1997) *The vitality of senior faculty members: Snow on the roof-fire in the furnace* (ASHE-ERIC Higher Education Report, 25(7). Washington, D.C.:George Washington University, Graduate School of Education and Human Development.
- Blande, C. J., A. M. Weber-Main, S. M. Lund, D. A. Finstad (2005). *The Research-Productive Department: Strategies for Departments that Excel*. Boston: Anker Publishing Company, Inc.
- Boice, R. (1986). Faculty development via field programs for middle-aged, disillusioned faculty: *Research in Higher Education*, 25(2), 115-135.
- Boice (1992). *The new faculty member. Supporting and fostering faculty development*. San Francisco: Josey-Bass.
- Boice, R. (1993). Primal origins and later correctives for mid-career disillusionment. In M. L. Finkelstein & M. W. LaCelle-Peterson (Eds.), *New directions for teaching and learning: No. 55. Developing senior faculty as teachers* (pp. 115-135). San Francisco, CA: Jossey-Bass.
- Burt, R. (1997). The Contingent Value of Social Capital. *Administrative Science Quarterly* 42:339-65.
- Burt, R. (1998). The Gender of Social Capital. In *Solidarity and Inequality*. Siegwart Lindenberg Wout Ultee and Rie Bosman, Eds.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology* 94:S95-S120.
- Donabedian, A. (1966) "Evaluating the Quality of Medical Care." *Milbank Memorial Fund Quarterly*, 44 (part 2): 166-206
- Emmett, A. (1992). A Woman's Institute of Technology. *Technology Review* April pp. 16-18.
- Etzkowitz, H., C. Kemelgor, M. Neuschatz, B. Uzzi, and J. Alonzo. 1994. The Paradox of Critical Mass for Women in Science. *Science* 266:51-3.
- Etzkowitz, H., C. Kemelgor, M., B. Uzzi (2000). *Athena Unbound: the Advancement of Women in Science and Technology*. New York: Cambridge University Press.

- Fox, M. F. (1984). Independence and cooperation in research: The motivations and costs of collaboration. *Journal of Higher Education*, 55:347-359.
- Fox, M. F. (1995). Women and higher education: Gender differences in the status of students and scholars. In J. Freeman (Ed.) *Women: A Feminist Perspective*> Mountain View, CA: Mayfield Press.
- Gainen, J. and Boice, R. (eds.) (1993). *Building a Diverse Faculty*. San Francisco: Jossey-Bass.
- Gebbie, K. B., A. Iradjizad, H. M. van Pinxteren, K. S. Budil, J. C. Joselyn, and L. E. McNeil. (2002). Getting Women Into Positions of Leadership Nationally and Internationally. In Hartline, B. K. and Li, D. (Eds.) *Women in Physics The IUPAP International Conference on Women in Physics*. NY, Melville.
- Henry and Nixon (1994). Changing a campus climate for minorities and women. *Equity and Excellence in Education*. 27:48-55.
- Kanter, R.M. (c. 1977). *Men and Women of the Corporation*. New York: Basic Books.
- Lawler, A. (1999). Tenured women battle to make it less lonely at the top. *Science*, 286:1272-1276.
- Luna, G. & Cullen, D. (1995). Empowering the faculty: Mentoring redirected and renewed. Washington, D.C.: The George Washington University.
- Margolis, E. and Romero, M. (1998). "The Department is Very Male, Very White, Very Old, and Very Conservative": The Functioning of the Hidden Curriculum in Graduate Sociology Departments." *Harvard Educational Review*, 68 (Spring): 1 – 32.
- Moody, J. (2004). *Faculty Diversity: Problems and Solutions*. New York: RoutledgeFalmer.
- Moore, K. M. (1984). Careers in college and university administration: How are women affected? In A. Tinsley, C. Secor, & Kaplan (Eds.) *Women in higher education administration* (pp-5-15) San Francisco: Jossey-Bass.
- Posavac, E. J. and Carey, R. G. (1980). *Program Evaluation: Methods and Case Studies* (1st edition). Englewood Cliffs, N.J. : Prentice-Hall.
- Rabe, K. 1999. Issues of Isolation and Community. In C. C. Selby (Ed.) *Women in science and engineering: choices for success*. *Annals of the New York Academy of Sciences* V 869.
- Sanders, K. and G. Mellow (1990). Permanent diversity: The deferred vision of higher education. *Initiatives*. 53: 9-13.

Brown University ADVANCE Grant Proposal
submitted to National Science Foundation July 2005
PI: Pam O'Neil et al

Seashore, K. D. Blumenthal, M. Gluck, and M. Soto. (1989). *Entrepreneurs in Academe: An Exploration of Behavior Among Life Scientists*. *Administrative Science Quarterly* 34:110-131.

Scott, R. W. (2003) *Organizations: Rational, Natural and Open Systems*. New Jersey: Prentice Hall.

Selznick, P. (1952). *The Organizational Weapon*. New York: McGraw-Hill.

Smith, D. (1996). *Achieving Faculty Diversity: Debunking the Myths*. Washington, D.C.: Association of American Colleges and Universities.

Tierney, W. and Bensimon, E. (1996). *Promotion and Tenure: Community and Socialization in Academe*. Albany: State University of New York Press.

Turner, C. (2002). *Diversifying the Faculty: A Guidebook for Search Committees*. Washington, D.C.: Association of American Colleges and Universities.

Turner, C. and Myers, S. (2000). *Faculty of Color in Academe: Bittersweet Success*. Boston: Allyn and Bacon.

Valian, V. (1998). *Why So Slow? The Advancement of Women*. Cambridge, MA: M.I.T. Press