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The ADVANCE Associates Program: An Intervention for Retaining Women Faculty Members in STEM

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ABSTRACT

The Associates Program was implemented as part of an ADVANCE Institutional Transformation award from National Science Foundation (NSF) intended to address difficulty recruiting and retaining women faculty members in the science, technology, engineering, and mathematics (STEM) fields at a university emphasizing undergraduate education. At the end of the grant period, it was found that ADVANCE Associates were retained at a higher rate than general STEM faculty (91% versus 69%). The current study sought to examine why this was the case and what made participating faculty more likely to stay at the institution. Focus groups with former associates, coded using a grounded-theory approach to analyses, revealed participants in the program reported reduced isolation and a greater willingness to advocate for gender equity, which they linked to participation in the program.

KEYWORDS

gender; academia; faculty; STEM; science; technology; engineering; mathematics; higher education;

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Although women are increasingly well-represented among science, technology, engineering, and mathematics (STEM) students, women remain a minority among faculty members in these disciplines (Monroe & Chiu, 2010). Research examining the reason for this “leaky pipeline” in academia emphasizes issues such as workplace climate and employee dissatisfaction (Valian, 2005). Recent studies have documented high levels of stress in women faculty (Catano et al., 2010; Hart & Cress, 2008). Stress and related lower job satisfaction are, in turn, linked to voluntary employee departure (e.g., Boswell, Boudreau, & Tichy, 2005; Cooper-Hakim & Viswesvaran, 2005).

Despite these challenges, research suggests that interventions to improve women’s experiences of workplace climate may be effective at improving job satisfaction and subsequent employee retention. When workplace climate for women is positive and women are well-represented at higher levels of administration, women employees display better job satisfaction (Miner-Rubino, Settles, & Stewart, 2009). Similarly, women who perceive that they have more voice in departmental matters show higher levels of job satisfaction (Settles, Cortina, Stewart, & Malley, 2007).

The intervention described here was designed as part of a larger institutional transformation program funded through the NSF’s ADVANCE Project, a major goal of which was to improve the retention of women faculty members in the STEM disciplines (for other findings from this project, see Nemiro, Hacker, Lucero Ferrel, & Guthrie, 2009; Nemiro, Hacker, Tucker, Lucero Ferrel, Prall, & DeJonghe, 2011). The current study examines the “Associates Program”, which was designed to generate buy-in and awareness of the broader goals of ADVANCE (e.g., an emphasis on the need for gender equity in STEM, awareness of gender imbalance and discrimination in STEM departments, etc.). One faculty member at a time served as an Associate from each of the STEM departments. Associates were responsible for disseminating ADVANCE information to departmental colleagues, encouraging participation in ADVANCE events, implementing a departmental speaker series that brought emerging women scholars to campus, and attending regular ADVANCE Associate meetings and other ADVANCE events. As compensation, each Associate received release from teaching one course per year. They attended six group meetings per year with fellow ADVANCE Associates and met once per year with the ADVANCE Primary Investigator (PI) and staff to discuss their progress as Associates, their work on speaker recruitment, and general professional development. Associates received education about topics related to ADVANCE, including unconscious bias, best practices in faculty recruitment, and strategies for implementing changes to department climate. They were also provided with information to share with colleagues in their departments about the larger ADVANCE Project (e.g., upcoming speaker events, trainings, mentorship programs, mini-grant awards) and received periodic updates about the findings of the ADVANCE Project to share (e.g., climate data, audience surveys from speaker events).

Although the Associates Program was not specifically designed to retain participating faculty members, at the end of the grant period, retention rates for ADVANCE Associates were compared to general retention rates in STEM for the period beginning in 2008, when the Associates Program began, through the fall of 2012. Participants in the ADVANCE Associates Program were retained at a higher rate (90.9%) than other STEM faculty (68.9%). While much of the difference in rates of retention may be attributed to differences in rates of retirement/death (23.4% for general STEM faculty vs. 4.5% for Associates), differences also existed in rates of non-retirement departure from the university; almost 8% of general STEM faculty members left the university, only 4.5% of ADVANCE Associates left the university during the same time period. The current study describes results of a qualitative evaluation of the intervention, which sought to understand what the impact of the Associates Program was and why Associates might have been retained at a higher rate than other faculty members.

METHODS

Participants

Over the 3-year period of the Associates Program, a total of 22 faculty members participated in the Associates Program. The majority of Associates (73%) were women. Associates were somewhat diverse with regard to ethnicity; 50% were White, 36% were Asian, 9% were Hispanic/Latino, and 4% were African American. All former Associates were invited to participate in focus group interviews (described below). A total of 18 of 22 former Associates participated in 6 focus group interviews. Detailed demographic information on participants is not provided to preserve confidentiality of participating vs. non-participating former Associates, but participants were demographically consistent with the Associates Program in general.

Measures & Procedures

Former ADVANCE Associates were invited to participate in focus groups in which they would reflect on their experiences as Associates. Upon arriving at the interview, participants received a copy of an informed consent form (as approved by the university's Institutional Review Board) for their review. Researchers then reviewed that the interview would be audio-recorded and transcribed, reminded participants to keep the comments of their fellow participants confidential, and explained that any quotes used in dissemination of the focus group data would not identify the speaker by name. Once all consent forms were completed, audio-recording began. Focus group questioning followed a semi-structured interview protocol. Four questions were asked. These included: "What were the positive and negative aspects of [your] experience [as an ADVANCE Associate]?" "How did your experiences as an ADVANCE Associate affect you?" "As an ADVANCE Associate, how did you affect your department or the larger campus community?" "During or after the time you served as an ADVANCE Associate, have you taken on any additional leadership roles in the university?"

All audio-recordings were transcribed and de-identified. Due to the exploratory nature of the study, interview data was analyzed using a grounded theory approach in which themes were not pre-determined, but rather emerged from a review of the data (Charmaz, 2006; Strauss & Corbin, 1998). Following transcription, two of the study authors [ESD and BAH] and a research assistant reviewed all transcripts and each independently developed a list of themes. These lists of themes were reviewed for commonalities and an initial list of codes was developed by consensus. Then, transcripts were reviewed again, and specific quotes were assigned thematic codes. The initial major thematic codes, as well as major sub-themes that emerged during coding are described below (see "Results").

RESULTS

Analysis of focus group transcripts revealed six recurring themes across the interviews, which could be grouped into three major themes. These themes are described below, with examples and the degree to which they were represented across focus groups presented in Table 1.

Connection. The first major theme to emerge was of increased interpersonal connections. Participants often discussed feeling isolated in their home departments and benefitting from the expanded network of personal and professional relationships they formed through ADVANCE. Many of these comments were made by women and addressed the discriminatory experiences associated with being one of very few women in their discipline. Often, discussions of reduced isolation were linked to comments about the positive emotional impact of the Associates Program and it is suspected that this is a major mechanism by which retention was improved.

Awareness. The second major theme to emerge was that of increased awareness of issues related to gender imbalances and discrimination in STEM. Some of these statements simply described increasingly noticing, and bringing attention to, gender imbalances in STEM. These types of comments were well-represented across multiple focus groups. Although not as commonly raised across focus groups, two focus groups talked extensively about how their experiences as Associates served to confirm the reality of their experiences of gender discrimination. As one participant explained, "it's not just something that's in my head, it's actually something that's systematic." Often linked to discussion of reduced isolation, these comments pointed to the fact that faculty members were often unsure whether the dynamics they were experiencing were rooted in gender discrimination, and the degree to which they were isolated as women in their discipline made it difficult to confirm their suspicions with others.

Awareness into Action. Perhaps as a result of feeling better able to identify gender discrimination and cope with under-representation in the workplace, the third major theme to emerge was related to translating awareness into action. Actions described by participants included increased involvement in mentoring, increased willingness to advocate for oneself, and increased willingness to advocate for others. Comments about increased action were often linked to increased awareness of gender bias (described above). As one participant described it, "I can speak on

it... it shouldn't seem like it's overly sensitive." It seems that reduced isolation helped participants confirm the reality of their experiences and this, in turn, improved their ability to respond to gender discrimination.

Table 1

Themes with Exemplars and Frequency of Discussion across Focus Groups

Theme	Description	Example	Frequency
<u>Connection</u>			
Professional Networking	Increased professional contact within the university or with the broader professional community	"Being an associate allowed me to network with other people in different departments."	5/6 focus groups
Reduced Isolation	Connections made through associates program reduced a sense of loneliness or personal isolation	"Sometimes we get bogged down by negative things that you perceive that are happening to you. And you felt like you were kind of alone....It feels good when you know there's somebody else on the same boat with you, and you're not just sinking alone."	5/6 focus groups
<u>Awareness</u>			
Basic Awareness	Increasingly noticing and/or bringing attention to gender imbalances and/or discrimination	"I think for me, the impact has had to do with elevated awareness... I kind of thought that I understood issues related to women but I discovered that I really don't.... It has made me more sensitive to the issues that are maybe at work—that I naively thought we had moved beyond."	5/6 focus groups
Validation of Personal Experiences	Awareness that gender bias experienced by participants was also experienced by other women	"All these activities we had, papers we read, made me realize that there were things that I think are unique to what I feel or how I behave... Then I realized it's on a bigger scope and it's not just me, and that was really helpful."	3/6 focus groups (discussed extensively in two)

Mentoring Relationships	Seeking out or providing mentorship as a result of ADVANCE experiences	"I think mentoring has become something that I'm really excited about now and that's something that I started thinking about with ADVANCE."	5/6 focus groups
Willingness to Advocate	Increasingly willing to speak out and advocate for themselves or to point out gender discrimination where they might not have in the past	"I've been more overt in asking for what I want as opposed to waiting until somebody figures it out." "I have been really, really pushy in the department in terms of trying to protect the junior faculty."	4/6 focus groups

DISCUSSION

In sum, these findings suggest some possible reasons that the Associates Program helped to retain women in STEM. Examining the themes that emerged in the focus groups, it seems that reducing isolation for women who were under-represented in combination with confirming the "reality" of experiences of gender discrimination may have improved ability to cope with and respond to potentially problematic workplace climates. A particular way in which participants in the Associates Program described themselves as having changed is that they became emboldened to speak out regarding gender imbalances and advocate for themselves and for junior women colleagues. Other research suggests that this ability to "speak out" is linked to better ability to cope with on-going climate problems; a study of women in the natural sciences revealed that while poor department climate generally contributed to lower job satisfaction, women who perceived that they had more voice in departmental matters showed higher levels of job satisfaction (Settles, Cortina, Stewart, & Malley, 2007).

Interestingly, these findings are contrary to research that suggests that women must adopt anti-feminist positions to survive in male-dominated fields. For example, research has demonstrated that women in male-dominated professions may need to adopt attitudes and behaviors that are stereotypically masculine (Gardiner & Tiggemann, 1999) or overtly hostile to women (Powell, Bagilhole, & Dainty, 2009). Comments made by participants in the Associates Program suggested that the program may have combatted this need to adopt anti-women attitudes, as exemplified by a faculty member's comment that the faculty member was more willing to speak out about gender discrimination and less concerned about backlash in the form of appearing "overly sensitive". It seemed to free the faculty member from the need to adopt anti-women attitudes or to collude with the fiction that gender discrimination was not present.

Clearly, there are limitations to the methods employed here. While faculty members involved in the Associates Program were retained at a higher rate than was typical, it is not clear what this retention "means." For example, retention could represent a

problematic outcome for faculty members if they were retained at their current position rather than accepting a better position at another institution. Furthermore, the intervention and its evaluation were conducted with a small group of faculty members at a single university. Faculty members voluntarily participated in the Associates Program and it can be argued that these participants were involved in the program because they were seeking change.

Despite these limitations, this intervention does suggest a possible method by which change can be implemented, even in the face of challenging and change-resistant departmental climate. Results of the assessment described here indicate that a secondary community was created and that this community itself seems to have been a mechanism for retaining the women involved in the intervention. Participants, particularly women, felt that the reduced isolation and “norming” of experiences offered by the program was essential to improving their ability to cope with, and work to transform, challenging climates.

For those who may be interested in implementing similar programs, we offer the following recommendations:

- *Seek out ways to reduce isolation and increase interpersonal connectedness.* Regular meetings of the full group and allowance of time for social interactions during meetings was very helpful in establishing camaraderie and connection among Associates.
- *Consider having an all-women or majority-women program.* Many comments in the focus groups pointed to the fact that having a majority of the group be women was an important factor in reducing the isolation experienced by women faculty.
- *Assess impacts even when you are uncertain about them.* In conducting the focus groups, we found that participants described far more profound emotional impacts of the Associates Program than we anticipated. However, those conducting interventions should be aware that many of the impacts appeared to happen “under the surface” and that we were surprised to find impacts where we did not believe the intervention had been particularly efficacious. For this reason, we would encourage others conducting similar interventions to conduct assessment even when changes may not be readily apparent to a casual observer.

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