



A Price Too High? Views and Expectations of Academic Careers by Female Science Graduate Students

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Introduction

U.S. women are underrepresented in science, technology, engineering, and mathematics (STEM) occupations, particularly in academia. Atmospheric Science (ATS) is an especially challenging case with regard to women's representation among its faculty. Despite significant growth in women's proportion of ATS doctorates—rising more than 10% between 2000 (23.4%) and 2010 (34%; NSF, 2013)—just 17% of ATS tenure-stream faculty at doctorate-granting universities are women (MacPhee & Canetto, 2014). Studies of gender and STEM academia have pointed to the rigid structure of academia for its role in interfering with women's career aspirations, particularly for women with family goals and commitments (Duberley & Cohen, 2009). At the same time, women's representation in academia varies by STEM field, suggesting that academia's challenges vary by field. STEM women's disinclination for academic careers likely matures during graduate school when career paths are evaluated in light of personal and professional goals (Mason, Wolfinger, & Goulden, 2013). The present study is the first to explore female graduate students' perspectives on the pursuit of an ATS academic career.

Study's Objective and Questions

This study was designed to expand our understanding of women's career-related views and experiences in STEM disciplines in which they are underrepresented, with a focus on the understudied STEM field of ATS. The present study specifically aimed to explore how women view ATS academic careers as well as the values that impact their career choice. In this study, 'academic careers' were defined as tenure-track faculty positions in university geoscience departments. Specifically, this study's research questions were: (1) What are your views of ATS academic careers?, and (2) What values impact your career choice?

Method

Participants: Twenty-five female ATS graduate (14 Master's and 11 doctoral) students between the ages of 22 and 30 ($M_{age} = 25.13$) participated in this study. Seven were married, 12 were in a committed relationship, and 6 were not in a relationship. None had children.

Procedures: Participants were recruited via email invitation and via student and faculty referrals. In-depth, semi-structured interviews were used to explore career-related views and experiences. Each interview was audio-recorded, transcribed verbatim, and edited for accuracy.

Method (continued)

Data Analysis: The interviews were analyzed based on grounded theory. Coding was completed by a four-member female team and consisted of a multi-phase process whereby all team members, (1) identified textual segments of interest; (2) organized emergent themes into hierarchical categories; and (3) described categories based on their properties and dimensions. Finally, narrative descriptions were created to further elaborate on key themes (Strauss & Corbin, 1998).

Data Trustworthiness: All interviews were independently coded by at least three researchers. Individual codes were discussed and revised in coding meetings, with final codes being achieved via a consensus process.

Findings

What are your views of ATS academic careers?

Academic careers are desirable:

"[A former professor] sparked my interest in becoming a professor because I could tell he really loved his job and he was just really passionate about it. I just thought that that was really great that you could have a job that you love so much."

Observing female ATS faculty makes me not want to be a professor...

"I don't want [my female professor's] life. . . . You know, 'It's great to see that you're succeeding, but you also had to sacrifice a lot that I'm not willing to sacrifice.'"

"I see a lot of women in our field, especially faculty . . . and it's like their personal life is not part of who they are as a scientist. . . . [That's] a barrier for me in this field."

"When I look at [female professors], it's not necessarily what they've done in the science, but what they do personally as well as the science. . . . It does make me not want to be a faculty member."

...especially because of the tenure clock:

"If I am starting a faculty job when I start having kids, I think time will be majorly loaded, so that's something I think about and worry about kind of a lot."

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Findings (continued)

Seeing female faculty with families makes having an academic career seem possible:

"I try to ask . . . women faculty what they've done [when deciding to have children], and I feel like everyone has done something a little bit different, which means that there is flexibility out there."

"I like how [my female ATS professor] did it. She really wanted to be a professor, but she kind of put that off until her children got older. . . . Until then she was a research scientist, which isn't as strict. . . . She could come in early and leave early so she could be home when the kids got home . . . that kind of thing."

What values impact your career choice?

Personal and professional goal alignment:

"In my perfect world, I would love to be able to have kids, a husband, a family, and adventure and a job, all be kind of one thing."

Flexibility to have a family:

"I haven't really decided on my career choice. . . . If I stay in research, it's great because you have such flexible hours and you basically work for yourself. . . . I can stay home and, you know, if the kid's sleeping, I can knock out three hours on my paper."

"If I went into a research field, especially if I went into the government sector, I've heard really good things about women working in labs – that they're really accommodating in terms of, you know, needing time for family things."

"I want to be able to be around as much as possible [for the children], so times when I can work from home is really nice if there's opportunities for that. . . . So I'm open to, to not being a professor right away if it means I can spend more time with children."

Compatibility with my husband's career:

"My husband has a job here and my parents are talking about moving out here, and we want to have a family, and for me, if I can't [find a job] very close, then I would have to consider looking at . . . sort of an alternate career path at that point."

Findings (continued)

Compatibility with my husband's career (continued):

"His career is gonna come first, not because of traditional gender roles, but just that I'm very happy doing a whole [lot of] different things, like I would love to go into education, . . . to do consulting, or stay for a Ph.D. My options are fairly broad, whereas, he's really happy doing the one thing he's doing."

Summary and Discussion

Female ATS graduate students in this study tended to view academic careers as requiring giving up on being an involved parent, and therefore as unappealing. Many women reported that their female and male faculty work pace appeared incompatible with parenthood. Many reported aiming for career paths (e.g., in research or consulting) they perceived to afford flexibility for parenting responsibilities, though—by their estimation—at the cost of science leadership careers. Several Master's stage women explained their decision not to pursue the doctorate in light of such considerations. The women who expressed interest in academia reporting feeling encouraged by observations of, and interactions with, female faculty who seemed to have both a rewarding academic career and a rich family life. These findings align with previous studies' findings that female faculty can be motivating or discouraging of female students' persistence in science, depending on what they model (Holmes & O'Connell, 2003; Hunton & Lane, 2007; Levine, González, & Martínez-Sussmann, 2009).

Female ATS graduate students also reported that their career choices were influenced by their intentions to support their male partners' careers, particularly in dual-career relationships. Specifically, women expressed concerns about finding an ATS academic position and a suitable job for their partners in the same location, in light of the relatively few universities with ATS (compared to most STEM) departments. This study supports and expands past findings on STEM women in academic science by identifying similar (work-family) apprehensions in ATS women's views of the academic career path. At the same time, ATS as a field appears to pose unique challenges to women's pursuit of academic careers, given the limited number of ATS academic departments nationally (74 ATS doctorate-granting universities vs. 200+ in mathematics, for example; NSF, 2012), combined with women's socialized tendency to prioritize their male partners' careers.

Acknowledgments

This research was supported by the National Science Foundation Science and Technology Center for Multi-Scale Modeling of Atmospheric Processes, managed by Colorado State University under cooperative agreement No. ATM-0425247 OSP No. 533045.

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