

The inside track from academia and industry

# Leaks in the pipeline

Why do women remain curiously absent from the ranks of academia?



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Family issues can cause women to abandon academia at every rung of the career ladder. Policy-makers have addressed some ways to get more women on to the lower rungs of the ladder. But solutions at the higher steps — tenure and beyond — are proving a little more difficult.

In the United States, the past 30 years have seen a dramatic rise in the number of women gaining PhDs in the fields of science, technology, engineering and mathematics, according to the National Science Foundation (NSF). In the geosciences, the proportion of PhD degrees awarded to women has increased from none in 1966 to 46% in 2003. But, according to a database held by the American Geological Institute, there are 'leaks' in the geosciences pipeline for academics — particularly in the hiring for assistant professor positions. In the field, 42% of BS/BA degree recipients, 45% of MS recipients and 39% of PhD recipients are women. But only 26% of assistant professors, 14% of tenured associate professors and 8% of full professors are women.

The biggest barrier lies in the structure of academia. Women may hesitate to apply for tenure-track jobs because they lack role models among the upper echelons. We conducted focus groups of active, employed geoscientists, including students, and found that nearly half of the women participants seriously considered leaving the geosciences at some point in their career, as opposed to only one-third of the men. The reasons for considering leaving are strikingly different between the two genders: the top two reasons for women were family issues (caring for children or elderly relatives) and problems with advisers (mostly a failure to communicate). By far and away, the main reason males considered leaving was an uncertain job market — a

distant second was a tie between difficult classes and choosing the wrong sub-discipline. We think that 'problems with advisers' is a barrier that can be minimized by training junior (and willing senior) faculty members in mentorship.

Clearly women's biological clocks play a role. Apart from medicine, in what other profession is it common for careers to begin in the early to mid-thirties? A new assistant professor, with an average age of 33, is facing the most intense work period of his or her life. For women at this age, fertility declines every year while the chances of a miscarriage or conceiving a child with Down's syndrome increase. Few graduate schools have provisions for family leave. Most graduate students answer directly to a single PhD adviser, who might not allow time off for childbearing.

More universities should provide paid family leave for graduate students and faculty members. Only one-third of PhD-granting institutions provide any sort of daycare for graduate students and most have no childbirth policy. Stanford

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University recently took the lead and introduced an automatic institution-wide childbirth policy for graduate students that includes six weeks' paid leave. Offering high-quality, affordable campus childcare will mitigate worries that could seriously lessen students' academic productivity.

Departments could actively recruit women and educate hiring committees. As

departments often know about openings a couple of years in advance, potential candidates in broad subject areas can be identified and courted.

There should be an automatic extension to tenure so that junior female faculty members do not have to choose between children and their job. Tenured women continue to leave because of family responsibilities. In a 40-year academic career, why not allow a temporary (one to three years) part-time option? Better assistance in spousal employment would help as well. Pennsylvania State University, for example, has temporary two- to three-year spousal appointments.

Although overt discrimination against hiring women has mostly disappeared, unconscious biases persist. As noted previously in this column (L. Bornmann *Nature* **445**, 566; 2007), gender bias can influence the awarding of grants and academic prizes. Unconscious bias in hiring and promotion has also been documented (B. J. Tesch *et al. J. Am. Med. Assoc.* **273**, 1022–1025; 1995). There needs to be a concerted effort to bring this to an end.

To help explore some of these professional and structural impediments, we are convening a consortium of geoscientist academics in New England. This NSF-funded endeavour has three components: a week-long retreat to focus on writing in the absence of departmental and domestic distractions; skills workshops on topics such as strategic persuasion and negotiation; and workshops for departmental chairs to learn about unconscious bias and ways it can be overcome. With attention to these details, we hope that the science faculty will look more like the student body in 2027. ■

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