The academic jungle: Ecosystem model reveals why women are driven out of science

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Understanding how a species battles to sustain itself in a challenging habitat is a cornerstone of ecological research; now scientists have applied this approach to science itself to discover why women are being driven out of academia. Their results, published in *Oikos*, reveals how a gender imbalance in science and academia is maintained by institutional barriers.

"In ecology a species can only establish itself and develop if the population exceeds a certain threshold," said Dr Katherine O'Brien from the University of Queensland, Australia. "It's similar for researchers and academics who need to reach a certain point before they can attract more funding, more students to teach and high quality collaborators which can increase their research productivity. Yet there are barriers which prevent women from reaching this point."

One of these barriers is the tendency of female academics towards part-time work in order to balance family and work commitments. Working part-time is rare in academia while university managers find it difficult to assess the research performance of part-time staff using traditional methods.

The performance of academics and researchers is increasingly assessed using set metrics such as the number of papers produced in a year or the number of citations the research generates.

While these metrics can promote research output within an organisation,

they can also undermine diversity, which in ecological terms is fatal to a species as it underpins resilience.

"To use the ecology analogy, research productivity is similar to the birth rate of a new species. Both need to exceed a critical rate if the population is going to grow and survive, or the academic is to become established in their field," said O'Brien. "However, research metrics are strongly biased towards full-time continuous employment and penalise academics who take time off before they become established."

The ecological model also suggests that if women have children before becoming established they will struggle to remain competitive with their full-time peers. This explains drift of women from research into teaching, where performance is assessed on current rather than accumulated historical performance.

To address the gender imbalance the authors suggest that women who go part-time should be strategic and concentrate on either research of teaching. In turn university managers should be cautious in judging success using metrics, and implement schemes to ensure that part-time work and career breaks are not "one-way tickets" out of research.

"The ecological approach demonstrates that any system which operates on a narrow criteria, be it a forest or a faculty, undermines itself by reducing both diversity and the pool of talent from which our researchers are drawn," concluded O'Brien. "In a working environment dominated by those working full-time women need to be brave and be prepared to be the odd ones out."

More information: Katherine R. O'Brien and Karen P. Hapgood, 'The academic jungle: ecosystem modelling reveals why women are driven out of research', *Oikos*, May 2012, DOI: 10.1111/j.1600-0706.2012.20601

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