Comment on 'Jobs for the boys'

More than 20 years after the introduction of measures to close the so-called gender gap, there is little evidence that these efforts have led to an even representation of women and men at universities and research institutions. In a recent editorial, Howy Jacobs pointed to some of the side effects of the gender gap, namely the associated waste of investments (Jacobs, 2011). Obviously, it is not cost-efficient to educate equal numbers of women and men without realising their full benefits for society. Even worse, the gender-specific brain drain happens mainly at the transition between post-doctoral fellow and principal investigator (Martinez *et al*, 2007), thereby maximizing the damage. In addition, given the enormous variety and number of scientific and technological challenges, society cannot afford to neglect the talent of a significant part of the population.

Detailed statistical analyses of the career paths of young scientists have been done, but have not provided comprehensive explanations of the problem (Ledin *et al*, 2007). The most common rationale is that childcare is a main cause of the low representation of women in academia. Although this is certainly true, the current share of female group leaders at all career levels is less than 20%, which cannot be easily explained by family status (Ledin *et al*, 2007).

If one assumes that each principal investigator mentors 25–50 post-doctoral scientists during his or her tenure, their chance of getting a faculty position is obviously less than 5%. Even worse, the current model in academic research will exacerbate the problem in the next decade. For example, both applications for and awardees of EMBO post-doctoral fellowships increased during the past decade by more than 50%. However, even before the financial crisis hit in 2007, the number of faculty positions at European and American universities remained stable.

As a consequence, pursuing an academic career must be seen as a very risky decision, even for successful scientists. The lower number of female group-leaders might therefore be explained by a different risk-taking, decision-making process in women. Simply put, women might be leaving academic research because they do not want to take a 5% chance for their future. If this is correct, the so-called gender gap points to a more-severe problem: the vast surplus of post-doctoral fellows, which exceeds demand by a factor of 20 or more. As a consequence, we have to face the possibility that a significant fraction of the most promising and talented people leave science regardless of gender.

The benefits of creating research groups comprising 10 or more post-doctoral scientists are unclear. From my personal experience, there is no positive correlation between publications per capita and group size. However, there are negative consequences, including reducing the quality of peer review caused by the low ratio between faculty and post-doctoral scientists. Applications for group-leader positions can no longer be correctly evaluated owing to their sheer numbers and time constraints, but have to be pre-filtered based on the number of articles in high-impact journals. If we retrospectively analyse the publication history of our most esteemed scientists, it is evident that many of them would never have got a principal investigator position under the current circumstances. Another point is that basic research cannot be planned in the same way as industrial research (Gannon, 2003). The system therefore penalizes researchers who pursue truly groundbreaking projects in research areas not currently associated with a high impact.

There is a possible solution. Research institutions could hire young scientists as independent researchers who could share

a laboratory, technical personnel and the administrative burden, thereby fostering collaboration. Such programmes are already in place at some research institutions, but only to bridge the time between post-doctoral fellow and group leader. These should be extended and, depending on success, it should be possible to grant rolling tenure.

I believe that such a career path could complement the current academic career structure and reverse the brain drain from basic research. Such a system would also be more cost-efficient. Recruitment for group-leader positions would be easier as well, because it is clear who made the main intellectual contribution to the published work. Finally, young scientists who have excellent skills to perform independent research might not yet have the experience or ability to mentor and manage a large group of researchers.

In conclusion, I believe that the gender gap is caused by a different risk-taking, decision-making strategy in women. Whereas the imminent problem of unequal gender representation should be solved by a quota system, the general brain drain from basic research has to be reversed by other means. I suggest a system that would, with minimal costs, keep highly talented people in basic research. In addition, it would foster research in fields not currently associated with a high impact, but which might prove to be interesting in the future.

CONFLICT OF INTEREST

The author declares that he has no conflict of interest.

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