

NEW RESEARCH ON WOMEN, SCIENCE AND HIGHER EDUCATION

Conference summary

This is a summary of the key themes from the Athena research conference held on 25 September 2001 at the Royal Institution of Great Britain, London. The event was attended by scientists, social scientists, representatives of professional bodies, equality practitioners and leaders in higher education (HE). The full report on the conference will be available later in the year.

Key points

- The low representation of women in the sciences¹ needs to be considered against a backdrop of decreasing numbers of students choosing science subjects as undergraduates
- Very few women achieve top positions in academic science – in 1998 there were only 97 women science professors in the UK out of a total of 3,092
- Even in sciences that are numerically ‘feminised’ women are still unlikely to rise to senior positions
- There is a need to consider not only women *in* science but also women *and* science, that is women’s engagement with the knowledge economy
- While women are as successful as men in obtaining research grants when they do apply, fewer women are in jobs where grant applications are usually made, including senior posts
- Funding bodies and higher education institutions (HEIs) need to introduce procedures to support women in obtaining research grants, including improved provision of information on funding applications
- Women’s exclusion from academic life is historical – even today women tend to be consumers rather than producers of HE
- Explanations for women’s under-representation in academia include the idea they lack the requisite skills. It is more likely, however, that the scientific culture is itself unappealing and unwelcoming
- Interest in women in HE and women in science is very high across Europe and increasingly within Eastern and Southern Europe
- Gendered patterns of vertical and horizontal segregation are similar in academia across Europe
- High levels of political will, childcare provision and so on, do not necessarily correlate with better representation of women at the top levels of academe
- There is a need for research to consider women’s academic careers at all stages, given evidence that progress may be hampered at any stage
- Universities UK has been charged with leadership training for heads of institutions and senior staff and seeks to ensure that women will benefit from this initiative, given their low representation at this level
- The Athena Project was launched in 1999 to improve the career progression of academic women in science, engineering and technology (SET)
- Athena’s activities include research, publication, sponsorship of institution-based projects, an Awards Scheme and dissemination events

¹ ‘Sciences’ refers to science, engineering and technology subjects rather than the broad definition used in other European countries that includes, for instance, health sciences, social sciences and economics.

Introduction

Though women now constitute 50% or more of first degree students and are gaining a greater proportion of postgraduate qualifications than ever before, women academics in science continue to experience difficulty advancing their careers. Even in the biological sciences where women now obtain more than half of all doctorates, they are still only 9% of professors. The conference brought together recent research findings to highlight factors that are still hindering progress and why change has been so slow. It considered how the findings could be used to improve the situation and to point the way for future research.

The Athena Project is funded until 2003 by the UK HE funding bodies, the HE representative bodies (Universities UK and the Standing Conference of Principals) and the Office of Science and Technology. It is now incorporated into the Higher Education Equality Challenge Unit (ECU). Athena's aim is the advancement of women in SET in HE and a significant increase in the number of women in top posts. The Project developed out of a number of initiatives mounted in the 1990's to address inequality in HE and science, including the Commission on University Career Opportunity (CUCO) and the Rising Tide Committee on women in science. In addition to sponsoring projects, Athena draws together and disseminates the findings of other studies - it was with this aim in mind that the conference was organised. A 44-page Athena report *Women scientists in higher education: a literature review*² that contributes to the information-gathering role of the project was launched at the event.

The conference was chaired by Dr Nancy Lane, Deputy Chair of Athena and Fiona Waye, Policy Adviser, ECU. Summaries of seven³ presentations are given below. These were followed by a panel discussion chaired by Dr Susan Atkins, Women and Equalities Unit, Cabinet Office, Professor Dame Julia Higgins, Chair, Athena Advisory Committee, Professor Joyce Hill, ECU, Dr Jan Peters, Promoting SET for Women Unit and Adrien Alsop, Economic and Social Research Council (ESRC)

Opening address - Professor Heather Eggins Society for Research into Higher Education

Professor Heather Eggins opened the conference by pointing out that the event was timely, given a recent headline in the *Times Higher Education Supplement* of 7th September saying that 'Science Take Up Declines'. This reported a continuing drop in the numbers of students studying the sciences including chemistry, biology, physics, microbiology and mechanical and chemical engineering. The number of women in some areas such as physics is particularly low and there has been a call to recruit more women and ethnic minority students into the sciences. A second problem is that of employment after an undergraduate science degree. While clearly there is a need for well-qualified science teachers who will encourage greater numbers of young people to choose the science route, not enough graduates are interested in teaching as a career. In addition, science careers generally do not offer competitive salaries. Thirdly, there is the historical problem of women scientists in academia. Even today, it is still the case that the higher the academic grade the lower the number of women. For example, in 1998 the total number of women professors in UK physical science and engineering was 97 out of a total of 3,092. In many sciences 2% or less of professors are women. At the very top only 3.6% of Fellows of the Royal Society are women. However, progress has been made – there are various initiatives and a general raising of awareness, as the conference will show.

² Available from the Athena office. See contact details at the end of this report.

³ Dr Louisa Blackwell, Institute of Education, University of London, gave a presentation on the 'Women's Scientific Lives' project: this will be included in the full conference report

Women and scientific employment – current perspectives

Dr Judith Glover, University of Surrey Roehampton

Dr Judith Glover drew attention to two overarching trends in women's scientific employment - firstly, that progress is slow almost to the point of stability, especially when compared to other professions such as medicine and law and secondly, that patterns of horizontal and vertical segregation within the sciences are similar across industrialised countries. There is a need to look at careers in terms of four distinct aspects: qualifying, translating qualifications into scientific employment, persistence and advancement⁴.

Dr Glover emphasised the importance of recognising that some sciences are numerically feminised, and this is true of many areas of sciences where women are gaining qualifications in large numbers. In terms of the second aspect - translating qualifications into scientific employment - women are more likely to go into teaching than men and are less likely to go into professional scientific employment⁵. Women are also more likely to enter 'associate' professional employment in science than men. As regards persistence, women, when they stay on in scientific employment, have a more short-term and discontinuous attachment to the scientific labour market than men. They are more likely to exit at an early stage of their careers or move into part-time work when they become mothers. A major point with regard to advancement is that even in areas that are numerically feminised, few women percolate to the top; this brings into question the critical mass theory that assumes that with greater numbers in the field there will be a subsequent increase of women at all levels of the hierarchy. Dr Glover underlined the need for new data, particularly on women working in private sector science, a view echoed strongly at European level.

There is a need to consider not only women in science - that is their education and employment – but also women and science, that is women's engagement with the knowledge economy. A further point is the need to move away from the 'deficit' model that finds women lacking in some way and the need for future research to address problems that appear to be embedded in the culture of science itself.

Who applies for research funding?

Dr Margaret Blake, National Centre for Social Research

Dr Margaret Blake reported on the research project *Who applies for research funding*⁶ undertaken by the National Centre for Social Research with funding from the Wellcome Trust and the UK Research Councils. The project examined gender differences in grant application behaviour. A key finding of the 1999-2000 survey of over 3,000 academics was that fewer women than men had applied for grants in the last five years, but those who did apply were just as likely as men to obtain grants. There were gender differences in the applications themselves; women were less likely than men to apply as principal applicants, applied for smaller grants and were less likely to apply for funding to the Wellcome Trust or the Research Councils.

The study found that for all the Research Councils, apart from the ESRC, women were less likely to fulfil the eligibility criteria than men. In addition, women's perceptions of eligibility were different from those of men's, with women believing they were less likely to be eligible even when they were. Women were more likely to be working in posts where fewer grant applications are made, i.e. part-time, fixed-term contract or junior positions. As regards professional profile, women with high publication profiles were as likely as men to

⁴ See Glover J. (2000) *Women in Scientific Employment*, Basingstoke: Macmillan

⁵ Fielding J, Glover J & Smeaton D(1997) *Gender and Science, Engineering & Technology*, ESRC: Swindon

⁶ Blake, M. & La Valle, I. (2000) *Who Applies for Research Funding? Key factors shaping funding application behaviour among women and men in British higher education institutions*, London: Wellcome Trust.

apply. However, fewer women than men in the sample had high publication rates. Recommendations for the funding bodies include reviewing funding opportunities for PhD students, reviewing gender equality as applied to funding allocations, disseminating information on funding opportunities and influencing employment practices within HEIs. The study identified the need for structured and transparent career opportunities, the creation of mentoring schemes, provision of information and support for funding applications and the need to address the home/work balance.

Recent research on women in the academy

Dr Louise Morley, Institute of Education

Dr Louise Morley began by discussing the exclusion of women from the academy, drawing attention to the relatively short period of time that women have been allowed into academia and then not to all disciplinary areas. Historically women have been associated with the life of the body and the emotions and men with the life of the mind, the traditional assumption being that women are incapable of rational thinking.

Various explanatory frameworks have been posited for women's under-representation in academia including the 'domestic responsibilities' model that assumes a common lifestyle for all women. Then there is the idea of women being 'in deficit' in terms of assertiveness, confidence, lack of mobility and so on. A further framework is the gendered division of labour, the statistics with which we are all familiar – it appears that a woman is 550% less likely to be a professor than a man! Although there appears to be a rational, overt agenda for promotion in terms of publication, conference papers, and so on, it appears that women have to be more productive than their male counterparts to succeed. It would seem that women are entering HE as consumers rather than producers.

Dr Morley discussed the perils of visibility and the need to 'prove' oneself; a narrative which she said dogs members of lower status groups. Emotional support is needed within the academy, but labour around this is gendered and goes unrewarded in terms of promotion. She highlighted new drives within HE policy including quality assurance and the widening participation agenda and the implications of these for the academy. In terms of power in academia, is it the case that though women are entering the academy this is accompanied by a lowering of status – the 'badges of distinction' argument?⁷ Has the entry of women into academia brought along with it the notion that 'where women are, the power is not?' Finally Dr Morley asked 'What is changing in HE? Is it having an impact on wider society and is it sustainable?'

Women in higher education – a European perspective

Dr Liisa Husu, University of Finland

Dr Liisa Husu said at European level there is much interest in women in HE and women in science, with many international events taking place throughout Europe. This includes Eastern and Southern European countries. European Commission activities are progressing rapidly as reported on the Cordis website⁸. Dr Husu pointed out that there are significant variations amongst European countries in terms of women academics' labour market participation. UK women have high rates of part-time working - 40% compared with 17% of Finnish women. Childcare provision varies, with better policies in the Nordic countries and France than in the UK. Though there are similar gendered patterns of vertical and horizontal segregation across academia, there are differences in the proportion of women professors in each country. This raises interesting questions. For instance, why is the proportion of women professors in Sweden not higher than that of Mediterranean countries, given it has high levels of political will and good childcare provision? Across Europe women's participation in HE is increasing - they now constitute over 50% of students. The male-domination of senior

⁷ See Morley, L. (forthcoming) *Quality and Power in Higher Education*, Open University Press

⁸ www.cordis.lu/improving/src/hp_women.htm

positions in academia is a Europe-wide phenomenon. There is a need to be aware that quantitative change may also accompany a decrease in the quality of working conditions – thus this needs to be taken into account in assessing progress. Dr Husu said that policies in general have not been sufficiently evaluated - countries that have had policies for decades are not necessarily those where most progress has been made. A further issue is the presence and visibility of gender studies that can put issues on the agenda and integrate them into science policy. There is a variation amongst countries as to how findings from gender studies are taken into account at policy level. Dr Husu spoke of Finland, questioning the myth that gender equality has been reached there⁹. As a result, women are surprised when they meet sexism in academia such as old boys' networks. These issues can be subtle and hard to tackle, but women are less likely to blame themselves if they can see the bigger picture.

Athena Project

Dr Diane Bebbington and Caroline Fox

Dr Diane Bebbington began by saying that the Athena Project is now based at the ECU that addresses the full range of equality and diversity issues within HE, not only gender. She outlined the structure of the project that is currently made up of a full-time researcher, a part-time Programme Manager and a part-time Administrator. Athena's work is guided by an Advisory Committee including Professor Dame Julia Higgins, Professor Wendy Hall, Professor Joyce Hill, Dr Nancy Lane, Rosa Michaelson and Dr Jan Peters.

As part of its research strategy, Athena undertook an extensive review of the literature on women scientists in HE¹⁰. This provides an overview of research on women academics' careers in all disciplines, focusing on key concerns and the efficacy of measures to address these. It brings together research on women scientists' careers in HE and highlights areas for further research. A key finding is the need to consider women's academic careers at all stages from qualifying onwards, given indications that no one stage in an academic career can be singled out as particularly problematic for women. The review looked at doctoral studies, career progression and women in positions of influence. At the start of an academic career fewer women than men complete doctorates in the UK, though their proportion of the total is increasing. More women than men now obtain PhDs in biology but they are still a minority in mathematics, computer science and engineering and technology. The need for more qualitative data on the PhD process was stressed.

Currently Athena is undertaking in-house research involving secondary analysis of the data from the *Who applies for research funding* project. This dataset has a wealth of information on many aspects of academic careers, not only grant application behaviour. The secondary analysis looks at the subset of women scientists in the survey, in particular those whose main research area is in life sciences, engineering and materials, mathematics and IT and physical sciences and processing.

Caroline Fox began by outlining the Athena Development Programme. In 1999 Athena awarded development grants to seven institutions. Four focused on mentoring – Bolton Institute, Sheffield Hallam, Nottingham and Loughborough (joint project) and Imperial College. The University of East Anglia developed a network for women at the beginning of their academic careers and the Open University undertook a study on career choices and barriers and the benefits of flexible working. Key findings of the mentoring projects included improved motivation and understanding of career obstacles, improved career development and networking opportunities. The five projects sponsored by Athena in the 2000 round of the Development Grants are now also complete¹¹.

⁹ See Husu, L. (2001) *Sexism, Support and Survival in Academia. Academic Women and Hidden Discrimination in Finland*, Helsinki: Department of Social Psychology, University of Helsinki

¹⁰ Bebbington (2001) Women scientists in higher education: a literature review. Athena Occasional Paper No. 1, London: Athena Project

¹¹ Reports on the 11 projects are available from Athena.

These addressed aspects of organisational culture within HEIs. The University of Luton project, for example, aimed to improve women's representation on university committees. Small grants were made to existing groups of women committed to women's career development and the support of Athena's aims. These became the Local Academic Women's Networks (LAWNs). They aim to raise the profile of women academics locally, promote the work of less experienced women researchers, encourage collaborative opportunities for researchers, encourage the appointment of women on to various institutional and academic bodies and integrate Athena's aims into institutional and departmental planning. There are now five LAWNs based around the UK at the universities of Leeds, Loughborough, Plymouth, St Andrews and UEA.

More Athena publications are in preparation including the first Athena Good Practice Guide, based primarily on recommendations from the 1999 Development Programme, but including conclusions from the ETAN report, the Royal Society of Chemistry's study on career choices of chemistry graduates, the POST report of its on-line consultation with women in SET and the *Who applies for research funding?* study. Future activities include the Athena Awards Scheme and a second good practice guide.

Senior women in HE – how far have we come? Diana Warwick, Universities UK

Diana Warwick highlighted the increase in the proportion of women on a range of public bodies in science-related fields. She welcomed the news of Julia Goodfellow's appointment as head of BBSRC¹² and reminded the conference that Professor Joyce Hill, Director of the ECU is a member of the Arts and Humanities Research Board. However, women continue to remain a minority of members on many bodies including the UK Research Councils with the exception of the ESRC. Too few women in influential positions leads to a skewed culture in which there are barriers to achievement and too few inspirational role models. Heads of HEIs were one example - out of 158 members of Universities UK and the Standing Conference of Principals, there are only 19 women. When the gender mix of Councils, appointment and interview panels are skewed it seems inevitable that problems of women's career advancement are compounded.

Universities UK has been charged by university Vice-Chancellors with leadership training for heads of institutions and senior staff, an initiative fully supported by Baroness Warwick. She said she would endeavour to make sure women benefit fully from the new measures not least because formal mentoring and coaching should help to counter the exclusion of women from informal networks. She expressed a strong personal interest in equity issues, having worked for many years as a trade union official and then as Chief Executive of Universities UK. She said that HE had shortcomings in this area which were little different from other sectors of public life. Nonetheless these shortcomings are obvious. Baroness Warwick welcomed the advent of the ECU, the first dedicated office charged with the task of dealing with equal opportunities in universities. Its aim will be to ensure that equality and diversity become a reality for all HE staff.

Further information including publications from:

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¹² Biotechnology and Biological Sciences Research Council