

**Gender, Mobility and Progression in
Science Careers
MOBISC Summary Report: UK
April 2005**



A book providing more detailed information about these findings – ‘Gender, Mobility and Career Progression in the European Union’ by Louise Ackers – will be published by Edward Elgar later in 2005.

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Under the directorship of Professor Louise Ackers, the **Centre for the Study of Law and Policy in Europe** (CSLPE) – based in the School of Law, University of Leeds - was formally constituted in 1993 to promote research activity into European Legal Studies and to develop wider interest through research projects, seminars and conferences.

With projects funded by the European Union (EU), the Economic and Social Research Council (ESRC), the Anglo-German Foundation (AGF), and the European University Association, current CSLPE research activity is concentrated in these main areas:

- Science Policy, Mobility and Brain Drain in Europe
- Mapping Social Science Research in the EU
- Impact Assessment of the Marie Curie Fellowship Scheme
- Mobility and Excellence in the European Research Area
- Citizenship, Migration and Care in the EU by Women, Children and the Retired
- Women in Science

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Key Conclusions

Women are participating at an equivalent and, in some cases, much higher level than men in science up to undergraduate level. The degree of feminisation then begins to show an overall decline; this is particularly marked in some disciplines (physics and engineering, for example) and in the industrial sector. The tendency of research and policy to focus on participation rates has, to some extent, distracted attention from the issue of progression. **An inverse relationship exists between the level of feminisation and seniority as women fail to progress in science careers at an equivalent rate to their male peers.**

The reasons for this are complex. **The expectation of mobility in science careers is clearly an important factor linked to other dimensions of progression.** The pressure to move reflects both the valuation of international and diverse experience but also the prevalence of fixed term positions and, in some countries, the lack of positions. **Women are as mobile as men in the early stages of research but their ability or willingness to continue to move decreases over the life course** as other responsibilities emerge.

Dual science career situations are highly prevalent in science careers. Indeed, they are 'normal'. These situations place additional pressures on scientists, and female partners in particular, seeking to combine the demands of a mobile research career with their personal lives. In many cases women fall behind in this process as male careers gain priority. Dual science career situations also shape location decisions encouraging people to locate to research clusters. **Even in situations where both partners secure research positions in the same country, women are more likely to commute than their partners.**

Working in another country presents many scientists with the opportunity to work extensive hours and really focus on their research without the additional responsibilities associated with work and family/social pressures. In these situations migrant scientists report accelerated productivity and career progression (at home or abroad). Our findings suggest that the (migrant) **scientists in our sample work extremely long and often anti-social and unpredictable hours.** They also show that these hours are disproportionately focused on areas of activity most likely to promote their career progression (namely publications and networking). **Scientists with children, and mothers in particular, are less able to commit these kind of hours and achieve an equivalent level of productivity.**

Not only is the use of time at work a key factor shaping progression. **The persistence of gender differences in the proportion of time spent on forms of unpaid/family work in the home restricts the ability of scientists with families, and women in particular, to devote a similar amount of time to their research.**

Mobility is, to some extent, a reflection of contractual insecurity. The prevalence of fixed term, insecure, employment positions in science presents a critical issue for many scientists wishing to plan their lives and progress in their careers. Women are generally less happy with these kinds of contracts than men. They pose immediate problems in terms of employment rights affecting maternity leave and other forms of benefit (such as pensions).

Introduction

The 'MOBISC' study was funded by the Employment and Social Affairs Directorate of the European Commission under a programme relating to the Community Framework Strategy on Gender Equality (2001-2005).

The study aimed to develop a better understanding of the factors shaping the career progression and representation of women in highly skilled, scientific, labour markets.

The study was completed in June 2004. It involved work in the UK, Portugal, Italy, Austria and Greece and took a socio-legal approach combining:

- Legal and policy analysis at EU and national level;
- Analysis of statistical data on the representation and progression of women in science;
- Key informant interviews with policy makers and employers;
- Questionnaires and life-history interviews with mobile male and female scientists (n=250).

This report offers a summary of the key findings of that study:

- The Representation of Women in Science: European Trends in Education and Labour Markets;
- Contractual Status and Progression in Science Careers;
- The 'Expectation of Mobility' and Progression in Science Careers;
- Excellence, Networking and Progression;
- The Impact of Working Hours on Career Progression in Science;
- Managing Dual Career Situations;
- Parenting, Care and Progression;
- Reconciling Work and Family Life: The Gendered Use of Time.

The Representation of Women in Science: European Trends in Education and Labour Markets

The ability to ensure full female participation in science is crucial to achieving the numbers of science and technology workers needed to fulfil the objectives of the European Research Area. Recent years have seen growing concern about the number of women studying and working in the science sector, a domain traditionally occupied by men. The growing number of female science graduates has moved the debate on from a narrow concern with participation, to issues of retention and progression.

High female participation in science at undergraduate level

The last two decades have seen a considerable rise in the number of females entering higher education. There still remains a disinclination for women to enter some fields of science (engineering, physics) which appears to start prior to undergraduate study (as female enrolment on first degree courses in these subjects are generally lower).

Gendered pathways in research

Women are consistently more likely to work in medical or social science research than engineering or physics. A 'horizontal segregation' of female researchers also exists; women tend to congregate in publicly funded research (in governmental research centres or Higher Education) rather than in the industrial sector. For the EU, as a whole, the majority of R&D expenditure is in the industrial sector.

Feminisation is not necessarily an indicator of progress towards equality

Higher feminisation rates do not necessarily imply greater gender equality. In some countries (notably Southern Europe and the accession countries) higher participation rates reflect poor levels of science funding. Higher levels of funding tend to be associated with lower feminisation rates.

Failure to progress

The most notable level of gender inequality is visible in positions of seniority, especially at full professorial level. In 1999 only 11% of professors in Europe were female. Even with greater attention to the problem of progression for female scientists the imbalance in positions of seniority remains steadfast. Women in professorial positions have been increasing at a rate of 0.5-1.0% per year in the EU, leading the authors of the ETAN report to conclude that: 'Clearly, waiting for a gender balance among the professoriat in European universities is not a particularly effective strategy'. (ETAN 2000: 12).

The gender pay gap

Highly skilled women face a discrete set of issues relating to pay. Research has shown an emerging polarisation of earnings amongst women according to skill levels. Figures for the UK, for example, show a widening of the pay gap in recent years; the gender pay gap of full time academics was 4% wider in 2002-03 than it was in 1995-96 (Association of University Teachers, 2004).

Contractual Status and Progression in Science Careers

The MOBISC study has identified the importance of contractual status to the career and migration decision-making of scientists.

Temporary contracts and science career trajectories

Working for a period on a fixed term contract is both accepted and expected by researchers as a route into their scientific career following doctoral studies.

Access to career progression

Temporary contracts provide flexibility in science labour markets, allowing for researchers to move between different working environments fairly easy. Often researchers choose to work within another research group to improve their curriculum vitae or to acquire expertise.

However, whilst contract research or 'post-doc' positions constitute an important opportunity in some circumstances, there are some clear weaknesses to the current system. Although mechanisms for career progression differ between the partner countries, such elements as experience of teaching, research and administration, access to strategic institutional positions, the ability to maintain a high publication rate, where restricted, have been found to cause problems for contract researchers. Furthermore, if continued into mid-career the position of the contract researcher can, by its nature, inhibit the career progression of a scientist.

Competition for permanent positions and working conditions

Academic scientists within our sample have stressed the difficulty of obtaining a permanent position. Since achieving a permanent position is the main route to future career progression, competition for these scarce openings is high. Such competition has implications for the way in which researchers on temporary contracts work. Specific issues such as working long hours, loss of autonomy and feeling unable to complain about working conditions or methods were raised within the interviews.

Balancing work and family life on a temporary contract

Fixed term contracts have specific implications for women and men who are trying to balance work and home life. Women are more likely to be employed on fixed-term contracts than men. The lack of security associated with temporary work is an important issue for researchers with partners and children. The expectation of repeated moves and temporary positions causes particular difficulty for scientists with partners and children.

Policy considerations

Temporary contracts provide a useful way for researchers to move between sectors, research groups and countries. The lack of a defined and predictable career trajectory for the 'contract researcher' appears to be a major issue effecting the retention of scientists. The work of the Research Careers Initiative in the UK and 'career planning curriculum for female academics' part of "Project Centre for the Advancement of Women" at the University of Vienna in Austria provide examples of projects designed to consider and begin to structure new routes to career progression.

The 'Expectation of Mobility' and Progression in Science Careers

ERA: The European Research Area

One of the milestones of the ERA is the mobility of scientists who are required to visit other laboratories and research groups to acquire the necessary skills and techniques and to share their own knowledge.

The relationship between the 'expectation of mobility', career development and excellence in the research sector

Mobility appears to be an important and common component in the science career trajectory. The extent to which a period of work in another country is necessary for the career progression of a scientist is country specific and dependent on such factors as discipline (for example in physics mobility is a "must"), perceived quality and size of the science labour market, measures to promote mobility and wider cultural factors.

Push and pull factors encouraging mobility

The pressure on scientists to move reflects the value attached to international experience and the potential to learn new skills and techniques. In some countries it also reflects the general lack of employment opportunities. In some cases, research grants abroad offer better opportunities than national schemes. Some respondents moved abroad mainly for personal and/or family reasons.

Inter-sectoral mobility

The extent to which a private research market is developed in the EU is country specific. A way of relieving some of the tensions of an academic career for many scientists is to seek a job in the private sector. This is very common for women who seek to combine work and family life. Whilst scientists employed in small or medium enterprises do not feel the pressure to move, those working in multinational companies do experience such pressure; here mobility is also linked to career progression.

Excellence, Networking and Progression

A theme emerging from our interviews with scientists concerns the relation between excellence, networks and progression.

Mechanisms for monitoring performance differ between countries

In some Member States (notably Italy) a clear relationship between performance criteria and progression did not appear to exist. Others (notably the UK) have adopted more transparent and apparently objective approaches designed to assess and reward research performance.

Networks are closely linked to career opportunities and progression

Nevertheless, networks and connections remain critical to career progression in all countries, to a greater or lesser degree. A close relationship exists between the ability to generate and activate academic networks and mobility (both in terms of working abroad and also attending conferences). The issue of time is of critical relevance to the ability to build networks.

Access to networks varies between countries and gender

To the extent that networks play an important role in the career progression in science, differential access to and ability to generate such networks is a factor shaping the career progression of scientists with family/personal responsibilities and of women in particular.

The Impact of Working Hours on Career Progression in Science

The research has placed an emphasis on the issue of time and the extent to which the use of time, and its implications, is gendered.

The expectation of long working hours

Scientists are working exceptionally long hours with both exceed the guidelines of the working Time Directive (48 per week). Most scientists work between 60 and 80 hours per week on average including weekend and vacation work. This work is unmeasured and unremunerated.

Working hours in industry

Scientists in industry tend to have more structured working schedules and work shorter hours although there is less overall flexibility in the timing and location of work. Over-time in industry is also more likely to be remunerated.

The functional quality of 'over-time' and its relationship to progression

Extensive over-time and weekend and vacation work contributes to the over-hours worked by scientists. The quality of work undertaken in this time differs to that which takes place during 'core-hours'. Out-of-hours work is strategically focused on publications, conferences and networking; outputs of this nature are privileged in terms of progression. Scientists able and willing to devote such hours to their research gain a distinctive competitive advantage over those who work 'normal' hours.

The impact of parenting

Scientists with children are less able or willing to commit extended hours to their research. They are less likely to work at weekends and to spend as time traveling for the purposes of conferences and meetings.

The 'migration' factor

Migrant scientists experience time pressures differently: for some, their status as research fellows releases them from other duties enabling them to focus on research, for others, they compress their time into a shorter number of days in order to enable them to spend time at home. Migrant scientists are less likely to have informal sources of support to enable them to cope with the demands of children.

The potential of legislative and policy intervention?

Scientists defend their right to work as much and wherever they like; their work is described as 'voluntary' and they resist measurement of their hours. For scientists flexibility equates with long hours and implies a flexible response to work as opposed to other responsibilities. This situation poses serious problems for those with families and restricts the potential for effective policy intervention.

Progression

Ultimately a level playing field for men and women and those with families can only be created in science through changes in the working culture, perhaps through additional resources and manpower, to eventually curb the propensity of scientists to work such excessive hours.

Managing Dual Career Situations

Dual science careers are the 'norm' for scientists

This is especially true in the natural sciences. They create specific challenges and opportunities. Women are more likely than men to be in this situation. Young scientists in the very early stages of their career paths appear to respond positively to the pressures for on-going mobility which they generally regard as beneficial up to that point. Although experiences vary considerably between individuals, in general, tolerance weakens after one or two periods on fixed-term post-doc contracts. This is the critical period in terms of potential exit. This situation may impact more on women particularly if they are the younger of the partnerships and at an earlier stage in their career trajectory.

Same career partnering has a dampening effect on career-related mobility

This effect is increasingly marked with age and as personal responsibilities emerge over the life-course. Women show a greater propensity to become 'tied-stayers' over time. This dampening effect also restricts potential return 'locking them into' the host state. This limits return flows and supports retention in the UK. The tendency for women to have a partner who is older (and hence likely to be more advanced in their career) and from the same or similar discipline means a woman is more likely to follow her partner to a new location, to the detriment of her career.

Women moving with a partner are likely to put their own career second

Where scientists in same career couples accompany or 'follow' the other in partner-determined moves they are likely to suffer career detriment, under and unemployment and de-skilling. This may eventually encourage them to leave academic research. Women are more likely than men to become 'tied-movers' or 'trailing wives' in spite of their highly specialised skills. The challenge of the dual job search can have a significant effect on a physicist's career. The frustration of unemployment and underemployment can also cause some to leave physics altogether, representing a net loss to the profession. As these employment problems are more acute for women, lack of attention to dual-career issues can hamper efforts to increase the representation of qualified women in physics.

Scientists often have to manage relationships from a distance

In addition to the effects on their career development, scientists report high levels of relationship breakdown and difficulties in forming new relationships. Many of them also tolerate periods of geographical separation from their partners and children sometimes for many years to safeguard their respective careers. Women scientists are both more likely to remain single and/or to move on their own. Recent developments in communications and information technology enable an increasing number of scientists in same career couples to achieve a better work-life balance. The extent to which they benefit from these developments reflects the nature of their work (whether they are teaching or not, for example) and the nature of their research (whether it is experimental or laboratory based, for example).

Research clusters attract in dual-career couples

Research clusters or 'escalator regions' both imply increasing mobility and represent a specific magnet to scientists seeking to establish two careers – many scientists are attracted to work in the UK for this reason.

Parenting, Care and Progression

The development of family responsibilities has a clear impact on the retention and progression of women in science careers. The nature of science careers pose serious challenges to scientists wishing to reconcile their professional and personal lives.

The pressures to move repeatedly, to travel regularly to attend conferences and undertake research, to work excessive hours and to tolerate a series of insecure, fixed term, positions are not conducive to the effective management of work-life balance. These immediate 'practical' concerns also map onto ideas about commitment to shape the progression of women with children.

Cultural factors

A variety of factors have been identified as inhibiting women's career opportunities, stemming first and foremost from prevailing cultural perceptions that locate women's primary vocation within the private domestic sphere. This is evident in the persistence of marked gender differences in the amount of time committed to unpaid work in the home (see below).

The impact of EU law and policy

While the EU institutions have been particularly proactive in developing family-friendly employment policies and in securing equal access to social entitlement under the free movement provisions, their practical impact at domestic level is still heavily influenced by entrenched cultural, political and economic norms. Consequently, significant divergences remain between the Member States in relation to the package of parenting entitlement on offer. Moreover, the structure and expectations of the scientific industry is such that a migrant's choice as to country of destination is dictated more by academic and training opportunities than it is by quality of personal life or levels of family support.

Reconciling Work and Family Life: The Gendered Use of Time

Time-use at home differs

The use of time in the informal, domestic sphere is a dimension of the reconciliation of work and family life so often neglected in studies of career progression. Yet the research shows that the use of time in this sphere is highly gendered with important implications for recruitment, retention and progression in carers such as science which demand long working hours. The interviews addressed two main question areas:

1. Whether mobile men and women scientists use their working and personal/private time differently?
2. How they manage their work-life balance?

'Work' and care are valued differently

The findings of the legal and policy analysis discuss the specific valuation of concepts of work in the EU and, in particular, the devaluation of care. Some Member States are beginning to develop national time use studies which throw light on the different amounts of time and activities that men and women engage in the home. The results of some of these suggest clear and persistent differences in the responsibilities of men and women. The interviews with scientists showed how the use of time is highly gendered both in terms of the time committed at work and that within the home. This differential has a serious impact on the amount of time and energy scientists with children, and mothers in particular, are able to commit to paid work with important implications for career progression.

Time use outside of work impacts on the ability to progress at work

Progression in science careers typically demands acceptance of long and anti-social working hours.

- The time commitments associated with family responsibilities restrict the amount and nature of the time scientists with families can commit to work; these processes are highly gendered;
- The requirement for mobility (even for short periods) often associated with career progression in science can be an additional source of time pressure and of conflict with personal and family life;
- Flexible working schedules in science are usually regarded by these women and men as favouring the combination of paid work and household and family care responsibilities;
- Time for ones-self (personal time) is usually scarce, especially when these mobile men and women scientists have small children to care for.