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PERSONAL AND PROFESSIONAL BARRIERS TO PARTICIPATION OF WOMEN IN INDUSTRIAL RESEARCH AND DEVELOPMENT (R&D) IN THE NORTH EAST OF ENGLAND

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Abstract

Concerns about the under-representation of women in science, engineering and technology (SET) in the UK have been raised by the Government and various other organisations since the seventies. However, 'Women in Industrial R&D' is relatively a new topic of policy and research. Based on 'face-to-face' interviews with 34 females working in some 60 scientific enterprises, this paper attempts to explore professional and personal barriers to participation of women in industrial R&D in the North East of England, a region with low levels of innovation and R&D activities. The results generally paint a more complicated picture than the traditional perception of overt discrimination against women and their career progression. Indeed institutional sexism largely appears to have been successfully tackled in many industries. More subtle issues such as male perception, rich male dominated informal networks, confidence-building, widening career horizons, and breaking down occupational stereotypes will take many years to achieve.

Key words: R&D, Gender, Scientific Labour Market, North East of England, SMEs, SET Pipeline

Introduction

Industrial research and development (R&D) critically relies on qualified researchers in the areas of science, mathematics, computing science, engineering, biology and chemistry. Despite the fact that in most European countries the numbers of female graduates are proportionately higher than those of male graduates, the scientific labour market remains male-dominated. Female graduates in the scientific disciplines generally constitute a small proportion of all female graduates. For example, in the UK, in 2002/2003 54 per cent (573,100) of all graduates were female, however, only around 15 per cent were in engineering and technology and around 18 per cent were in physical sciences, (EOC, 2005).

Concerns about the under-representation of women in Science, Engineering and Technology (SET) have been raised and expressed by the Government and various other organisations since the seventies. In 1994, the UK Committee on Women in SET produced the report 'The Rising Tide' - A Report on Science, Engineering and Technology, (HMSO: 1994). This report provided an overview of the continual 'dropping out' of girls and women at every stage of the SET 'leaky pipeline' - from choosing science subjects at school, to first degree, higher degree, and then in the scientific labour market. The Rising Tide identified a number of key areas of concern, including, education, training, employment and positions of influence. Since the publication of the report, considerable efforts have been devoted to the development of numerous initiatives, reports and consultation, particularly at national levels. In 2002, for example, the Government commissioned Baroness Greenfield to investigate the reasons for the low participation of women in SET. In her report, 'SETFAIR',

Greenfield concluded that Women are underrepresented in nearly all areas of scientific activity and the slow progress in attracting women with an appropriate level of education into a SET career is based on; continued lack of information; few visible role models and mentors; pedagogy of science and technology; and little hands on experience, (DTI, 2002).

However, even with the slight improvement in female participation in the scientific labour market in recent years, the number of women reaching high positions in science is still much lower in the UK, particularly in the less favoured regions such as the North East compared to the USA and many other European countries, (ONS, 2004). Moreover, women in industrial R&D is a relatively new topic of EU policy and research and, as such, data on female participation in industrial R&D in the UK at national or regional levels is minimal. We know that women's recorded participation in science, technology, innovation, etc. is lower than their overall participation in the workforce, particularly in the North East of England, but we do not know the details of why this is the case. As a result, the region may be missing a fundamental means of increasing its R&D base, (ONS, 2004).

This paper builds upon a research project funded by the 'Economic and Social Research Council (ESRC) Science in Society Programme' entitled 'The Impact of Gender Innovation on Regional Technology, Economy and Society', (www.sci-soc.net). The project investigates gender disparities in scientific activities in terms of research and development, innovation, invention and exploitation of IPR amongst employees working in the Science, Engineering and Technology (SET) communities in both the public and private sectors in the North East of England. It aims to identify the mechanisms by which female employees (including from the ethnic minority communities) in SET can go on to generate or actively participate in R&D, invention, innovation and the creation of IPR. The research is further supported by Higher Education European Social Fund National Programme in order to investigate gender inequality in the scientific labour market at a national level.

Based on the results of 'face-to-face' semi-structured interviews with 34 females working in 60 scientific small and medium sized enterprises located in the North East of England, the paper aims to investigate professional and personal barriers to participation of women in industrial R&D in the North East of England. The paper builds upon and expands from a recent paper which has empirically investigated the level of participation of women in industrial R&D in the North East of England, (see Wynarczyk and Renner, 2006) and to our knowledge the first empirical investigation of its kind in the North East of England.

The paper consists of three sections. Section one provides a brief background to the participation of women in SET in the UK and the North East. The empirical findings are presented in section two and section three concludes the paper. The nature of the R&D employment and expenditure in the UK and in the North East, participation of women in the labour market in general and in industrial R&D in particular have been presented in the original paper, (see Wynarczyk and Renner, 2006) and due to the limitation of space will not be revisited in this paper.

Section 1. Women in SET and R&D

In most European countries, the numbers of female graduates is proportionately higher than those of male graduates. However, the scientific labour market remains male-dominated. Women face obstacles to their scientific work simply because they are women, and as a result, are under-represented in the sciences and decision-making bodies concerned with scientific issues, (European Communities, 2003). According to the UK Government Initiative, 'Promoting Science, Engineering and Technology (SET) for Women Unit', "*although women are beginning to make progress in SET, albeit slowly, they have not entered all disciplines of SET to the same extent as men. Where they have, they remain at or near the bottom rungs of the ladder. Moreover, in some fields, the position of women is worsening.*" (SET4Women, 2004)

Etzkowitz et al (2000) in discussing the place of women in science and technology (this discussion is limited to the processes by which women achieve final positions as senior academics) sees the process of gender differentiation beginning at a very early age. They suggest that women have no inherent incapability to follow a career in science but that they follow a 'pipeline' process. The process begins in infancy with a large supply of potential scientific workers but as the process of socialising, education and employment takes place the pipeline is found to be leaking at various joints (decision points in life-chances) that results in only a trickle of women eventually emerging to make successful careers in science. Etzkowitz et al (2000) claim that from an early age:

"...boys and girls develop different gendered images of scientists and what they do." (p26).

"In many ways, women are unable to choose to do science: society has already chosen who will do science through its construction of gender roles." (p47).

The home and school environment influences girls' vision of their role in society but also their degree of assertiveness, experimentation, self-motivated exploration and risk taking - important features in the lives of successful scientists. These factors influence women's choice of subjects at school (e.g. maths) and their subsequent capabilities and confidence to undertake front-line scientific positions. This is before taking into account family issues and explicit hostility to women in male dominated sectors. Because science has for centuries tended to be dominated by men, the culture of scientific inquiry and the cultures of scientific departments also tend to be predominantly male. Women who wish to pursue careers in science can be subject to adverse 'weedout', find they have to be better qualified than their male counterparts to be selected for scientific posts and have difficulty in entering rich networks of information exchange, departmental and other research teams and group grant applications. In order to succeed some women have had to adopt the characteristics of the male species. Seniority in scientific positions for the few women who fill them tends to require more items of merit and come at a greater age for women than for men. It is claimed that glass ceilings remain for women in many career paths, (Wynarczyk and Brown, 2005).

Additionally, women often feel intimidated from entering male-dominated environments such as the SET sectors and find it difficult to break out from inertia. For this reason, they often opt out of pursuing a career in such industries, with

evidence presented in Baroness Greenfield's report 'SET FAIR', (DTI, 2002) showing that women with degree-level qualifications in these fields are more likely to take up clerical or administrative positions than equally qualified men. Whilst many women choose to combine a family and a career, some leave the SET community and then face additional barriers when they wish to return, to the extent that many never come back. This is a huge waste of talent, skill and investment in our society, as well as a poor example of an inclusive community.

At present, there is no gender breakdown of patentees, R&D and other IPR (design, trademark and licensing), spinout and innovation activities in the UK, let alone at regional levels. The data also tends to cover women in positions that have a potential to produce technological advances, rather than identify women's contributions to various facets of R&D and engagement in the processes of invention and innovation themselves. SET data is based on skills and occupations rather than actual jobs and level of participation (or indeed the lack) in scientific activities (e.g., R&D, IPR, innovation process, etc). The opportunities for employment in R&D and invention and innovation are dependent on the region in which you are located. In spite of a long history of such activities, the North East has been consistently identified in recent years as having low levels of innovation and R&D. The region underperforms in two commonly used innovation measures - research and development (R&D) and patent activities - compared with more prosperous regions such as the South East, even when population adjustments are made, (Wynarczyk and Johnson, 2005; Wynarczyk and Renner, 2006). Sadly, these opportunities appear to be particularly low for women in the North East.

Generally, in less favoured regions of the UK such as the North East, gender inequality in the scientific labour market is partly a legacy of the tradition, culture, perception and male domination of the workforce. Women are under represented in senior positions within business, public and political spheres and earn significantly less than men, particularly in the SET sectors. As a consequence of this under-representation, there is a lack of successful female role models within the region, (Wynarczyk and Brown, 2005, RDP, 2000-2006).

Section 2. Women in Industrial Research and Development (R&D) in the North East of England: An Empirical Investigation

The focus of the empirical analysis reported below is on female employees working in SMEs engaged in Science, Engineering and Technology (SET) related sectors, operating in the North East of England. During the process of identifying these firms in the North East of England a questionnaire was sent out to over 600 SMEs operating in various SET related industrial and service sectors in the North East of England. These firms were identified through various company directories and data sources, including, DTI SMART AWARD winners, FAME, AIM, Queens Award to Industry, North East Chamber of Commerce, companies located in the North East Business Incubators and business parks (e.g., North East Business and Innovation Centre/BIC). The questionnaire was specifically designed, covering several aspects of the business operations including an overview of the level and nature of innovation and R&D activities, technological characteristics, employment by gender, ownership and management structure by gender, human resources practices, skills and training policies, equal opportunity policies, flexible working practice, etc. The postal survey

resulted in the creation of a unique database of over 200 SMEs. A number of experts from the North East Business and Innovation Centre were consulted to assist in the identification of SET SMEs from the database. As a result, 60 firms were identified and included in the analysis. Furthermore, semi structured 'face-to-face' interviews were held with representatives of around 20 of these 60 enterprises to explore in more detail their equal opportunity policies, flexible work practices, skills and training, management structures, human resource development policies, R&D and innovation processes notably as they encourage the participation of women in R&D and other scientific activities. They were also encouraged to provide details of their key female employees involved in technical, scientific, R&D and innovation processes, as well as those involved in non-scientific activities such as sales, marketing and human resources. Around 70 members of staff were contacted and semi-structured 'face-to-face' interviews were conducted with 19 female employees engaged in industrial R&D and technological advance, as well as 15 female engaged in senior and managerial position but in non-scientific areas. The purpose of this exercise was to identify the level of involvement in R&D and innovation activities, background, qualification, current and previous positions, tasks undertaken and possible causes of inequalities, e.g., segregation, gender stereotyping, institutionalised discrimination on recruitment, pay gap, aspiration, access to skills and training, work-life balance, family commitment and childcare, personal and professional barriers to entry and progression, etc. The results of the postal survey and face-to face interviews have provided a wide range of both quantitative and qualitative data, however, for the purpose of this paper, only limited relevant data has been used.

The empirical results presented in this paper focuses on the personal and professional characteristics of 34 females, 19 with R&D related employment and the remaining 15 with non-scientific or R&D related employment. The paper compares and contrasts age, marital status, dependent children, and attempt to match their qualifications and previous positions to current positions, allowing the examination of the SET pipeline.

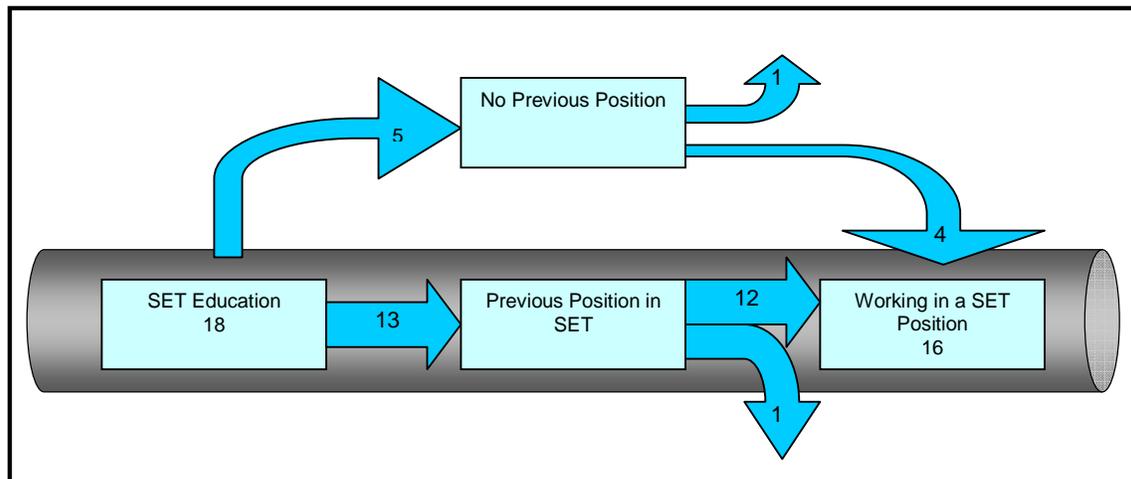
2.1 Women in Industrial Research in the North East: Examining the SET Pipeline

As mentioned above, current research suggests that women with degree-level qualifications in SET related fields are more likely to take up clerical, administrative or low paid technician positions than equally qualified men. However, the lack of women in industrial R&D employment within SET related SMEs in Europe as a whole has been attributed to the fact that fewer women study science related subjects at university, (European Communities, 2003) and as a result less likely to enter SET positions. Data presented in this paper attempts to match qualifications with current posts. The results of the 'face-to-face' interviews generally demonstrate that those women who hold scientific qualifications and are engaged in industrial R&D in the North East are more likely to hold chemical related qualifications than any other scientific qualifications and work in the chemical sector, specifically 11 out of the 18 respondents with SET related qualifications held chemical related qualifications. The chemical sector is one of the strongest sectors, in terms of R&D expenditure and employment, in the North East. In the North East, R&D effort is mainly concentrated in chemicals (62 per cent in comparison with UK of 28 per cent), (MA14, 2005). It can be argued that women have inherent skills that make them more suitable than men for different positions in the workforce. While this may be a lightly disguised excuse to discriminate against women there may be something in the argument that certain

research fields are better suited to their talents (e.g. chemicals) or for which they have a strong empathy, e.g. environmental issues. It is, therefore, interesting to note that the chemical sector is one of the few areas of scientific research in which women have the opportunity to participate in the North East. It is also interesting to note that the chemical sector in the region attracts women with chemical related qualifications from elsewhere in the country. The results show that a number of these women obtained their degrees or PhDs from non-North East universities (e.g., Cambridge, London and Melbourne, Australia) and moved to the North East to take up their current positions.

The results generally reveal that 16 out of 19 participants who held SET related position had SET related qualifications. One held non-SET related qualification and the remaining two had no formal qualifications but substantial industrial experience, which they considered as being equally important. Unlike the higher education sector, holding a scientific degree or PhD is not a requisite for having a scientific related position in the private sector or setting up a SET related company, industrial experience and inventiveness appear to be important. Further examination of data suggest that 11 out of 15 participants who held non-SET related positions had non-scientific qualifications but held, mainly, personnel, admin, business studies and marketing related qualifications. Only two of these participants held SET related qualifications but had non-SET related positions. An examination of the SET pipeline amongst the 34 participants show that 18 of all 34 participants had SET related qualifications and 16 of which held SET related positions and were engaged in industrial R&D (Diagram 1). The SET pipeline will be fully examined in a follow up paper.

Diagram 1 - The SET Pipeline (by number of respondents who held SET related qualifications)



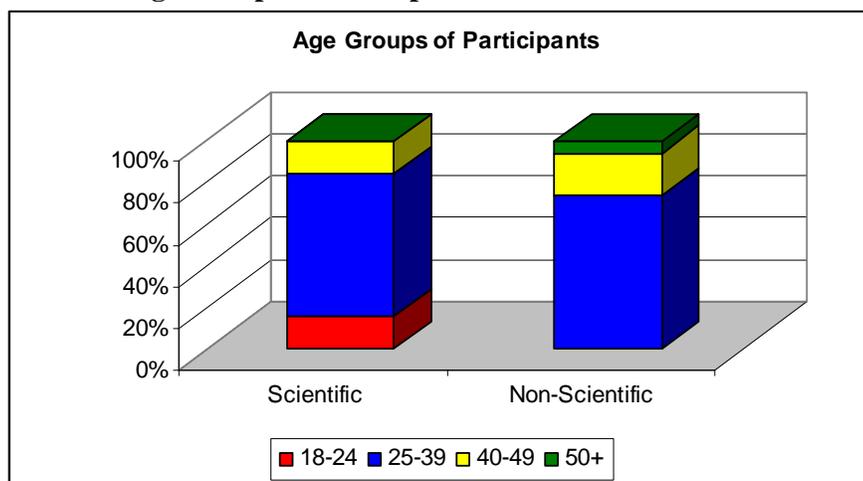
2.2 Age of Participants

Research shows that female researchers generally tend to be younger than other employed women, (EOC, 2005, Labour Market Trends, 2003). The results presented here confirm this. A relatively higher proportion of women in industrial research were below the age of 40 (i.e., 84 per cent) than women who held non-scientific posts (74 per cent) and none were over the age of 50; (Table 1 and Chart 1)

Table 1 – Age Group of Scientific and Non-Scientific Employees

	All		Scientific		Non-Scientific	
	No	%	No	%	No	%
18-24	3	9	3	16	0	0
25-39	24	70	13	68	11	74
40-49	6	18	3	16	3	20
50+	1	3	0	0	1	6
Total	34	100	19	100	15	100

Chart 1 – Age Groups of Participants



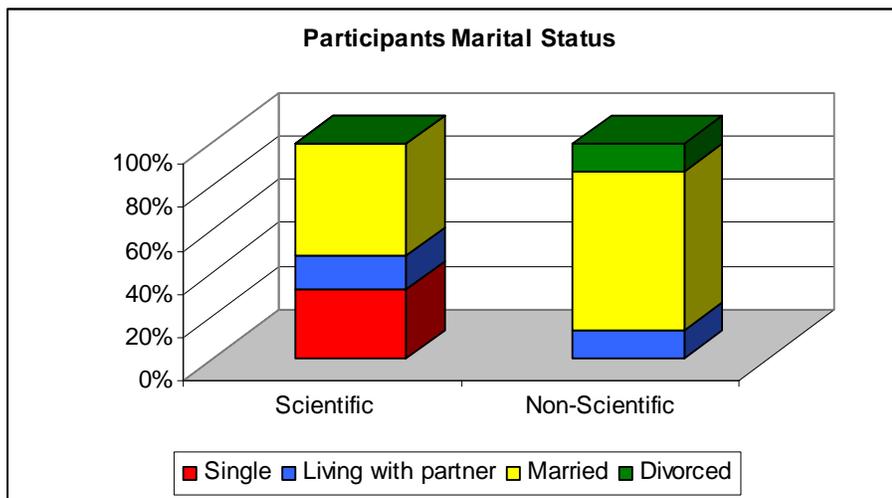
2.3 Marital Status of Participants

Existing statistics show that married women (with or without dependent children) are more likely to work on part time basis, (EOC, 2005). In 2003, out of all married women in employment in the UK some 34 Per cent worked part-time compared with 24 per cent of all economically active unmarried women, (Labour Market Trends, 2003). To our knowledge there is no data available on the marital status of the female researchers. The results of the face-to-face interviews show that 32 per cent of the women in industrial research were single compared with none of those who held non-scientific positions. The remaining 68 per cent either lived with a partner (16 per cent) or married (52 per cent) but none divorced, (Table 2, Chart 2).

Table 2 - Marital Status of Participants

	All		Scientific		Non-Scientific	
	No	%	No	%	No	%
Single	6	18	6	32	0	0
Living with partner	5	15	3	16	2	13
Married	21	61	10	52	11	74
Divorced	2	6	0	0	2	13
Total	34	100	19	100	15	100

Chart 2 – Marital Status of Participants



2.4 Family Commitment

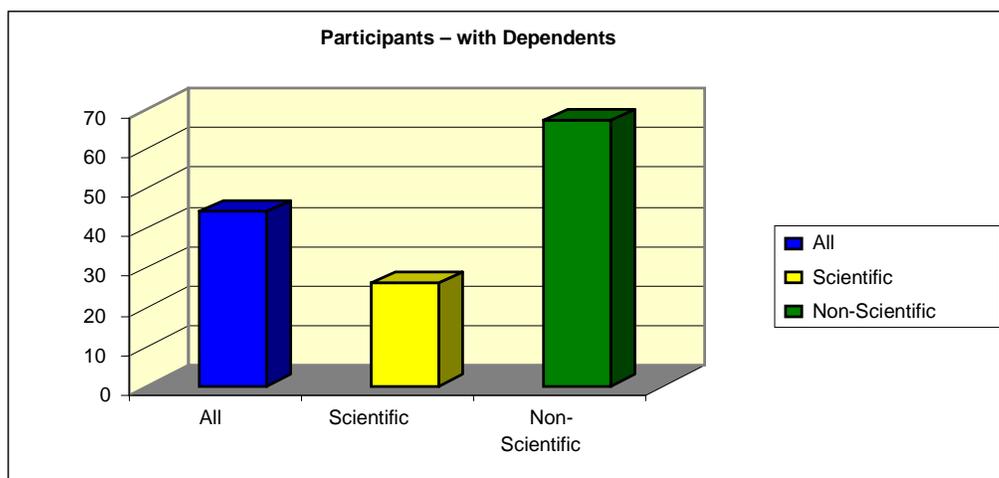
Employment rates for women are closely linked to the presence of, and ages of, dependent children in the family. In the UK, the employment rates for women with dependent children in 2004 were 52 per cent for those living with pre-school children, 71 per cent for those with primary school children and 77 per cent for women with the youngest dependent aged over 11 years, compared with 67 per cent for women without dependent children, (EOC, 2005).

In the UK as a whole, employment rates for those in a family with dependent children were much lower for single women, although lone mother employment rates have seen a rapid increase over the past five years. In 2002, the employment rates for partnered women and single women stood at 70.2 per cent and 50.3 per cent respectively. The gap between partnered mothers' and lone mothers' employment rates has closed by 4.3 percentage points between spring 1997 and spring 2002, (Labour Market Trends, 2003).

Existing research suggests that as women engaged in industrial research tend to be younger it may, partly, explain the reason why relatively fewer of them have children compared with other female employees. However, research also suggests that highly qualified women are more likely to postpone maternity than other female employees, (European Communities, 2003). The results presented here show that only 26 per cent of the women in industrial research had dependent children compared with 67

per cent of the non-scientific counterparts. Around 30 per cent of participants said they did not wish to start a family, as this would prevent them from progressing further in their careers. Those who worked in chemical R&D and wished to start a family raised concerns about health and safety issues relating to handling unsafe chemicals and worried about getting pregnant in case '*chemicals handled would harm unborn babies*'. As a result, a number of women express their dissatisfaction with working in labs and preferred to find non-lab jobs even if this meant moving out of the region due to the working conditions and unattractive environment that labs generally offer, (Chart 3).

Chart 3 - Participants with Dependents



However, a high proportion of those with dependent children and other family commitments (e.g. living with a partner) faced problems with lack of suitable child care facilities, barriers to participation in career development related activities such as travelling abroad and attending conferences and participation in outside normal working hours and social and networking activities, such as attending dinner parties or football matches. The following comments were quoted by a number of participants;

'Personal circumstances at home became my main focus for a while and my work had to take a secondary role. I was not keen to pursue any further development etc as my job at that time was the most constant thing in my life'.

'A partner did not wish for me to travel long-distance on company business, limiting my role'. 'I have had childcare difficulties. My husband works abroad on a 4 week rota, so I have to arrange childcare for my children aged 11 and 14. This has prevented me going on business trips out of the area'.

Most of the initiatives of the Commission and the member states on women in science have focused on the public sector where statistics are more readily available - statistics on participation in the private sector, especially at regional levels, are more difficult to obtain. As 'Women in Industrial Research: a Wake up call for European Industry' 2003 has stated, greater participation of women in R&D within the private sector will provide access to untapped pool of talent which in return will contribute to growth and development of scientific enterprises. However, this requires a dramatic cultural and institutional change.

2.5 Other Barriers

In addition to work-life balance issues, several other personal barriers commonly shared amongst a high proportion of participants, including lack of confidence and self-esteem, lack of women scientist role models, lack of support from teachers, limited facilities at schools and low expectation of girls at school. One of the participants commented;

'At school, I thought the height of ambition was when a girl wanted to do further training to get NNEB to become a nanny. No one talked of being a doctor – to become a nurse was an extremely high ambition'.

2.6 Professional Barriers

The results of the study demonstrate that because of EU equal opportunities legislation in education and employment formal discrimination against women have, generally, been removed. A high proportion of surveyed enterprises (around 80 per cent) had a formal or written equal opportunity policy and a high proportion (70 per cent) of women seemed to be aware of their existence. However, there are a number of both professional and institutional barriers, which continue to prevent actual equality for women in SET to take place.

In terms of professional barriers, institutional sexism, informal male networks and male biased incentives such as attending football matches or gala dinners, outside normal working hours' social activities, male colleagues' perceptions, as well as career development opportunities such as training have commonly been mentioned. A high proportion of women blame their male colleagues and bosses for lack of confidence or progression. A number of participants shared the following comments;

'Sometimes I have not been taken seriously enough because I am female. For example when in the pharmaceutical profession when talking to professors/surgeons they did not expect me to have sufficient knowledge and looked down at me on occasion'.

'There is a degree of institutional sexism, particularly with customers/suppliers of the older generation who prefer to speak to male colleagues when 'getting down to negotiating'.

'When I worked in London, I did not feel that there was as much a male chauvinist attitude down South as there is up North. And when I worked in Manchester there wasn't as much 'superior' attitude there either'.

'Working in a male dominated environment (90% men) it may be that my ideas have had less kudos, than those suggested by male colleagues'.

'not being allowed to make decisions without prior discussion with a more senior male colleague slowed down the process of confidence building and inevitably affected my professional development'.

However, as the following comment demonstrates, a few participants see women minority as an advantage;

'as there are fewer females in this area it is slightly easier to stand out. However, in saying this it is imperative that a quality job is carried out'

'I believe the main reason I have been asked to join a high level committee is because I am a woman scientist'

One of the participants commented: *'there are not many opportunities for alternative scientific jobs in the North East region, so I may have to move out of the region to find a more suitable job'*. It can be argued that as the R&D activities in the North East is low there is not demand for qualified scientists and R&D researchers. However, there is evidence that North-East manufacturers are hiring staff from Europe in a bid to tackle skills shortages as demonstrated by comments provided by one of the participating firms commented that 'we may force to import skilled labour from Europe if North-East skill shortages continue to hamper our global expansion plans'. It is essential to ensure that there is a sufficiently qualified workforce both in terms of number and skill level to meet these future demands by drawing on a wider pool of talent and ideas, including the participation of women who are currently so under-represented. From the evidence provided above it appears that there is very little confirmation of a gender-balanced scientific workforce in the R&D departments of North East companies, apart from chemical related businesses where there is evidence of a greater participation by women.

Section 3. Summary and concluding remarks

This paper, based on the results of 'face-to-face' semi-structured interviews with 34 females working in 60 scientific small and medium sized enterprises operating in the North East of England, has investigated those professional and personal barriers which tend to prevent participation and career progression of women in industrial R&D in the North East of England and make policy recommendation to remedy the current unacceptable under-representation. The paper builds upon and expands from a recent paper which has empirically investigated the level of participation of women in industrial R&D in the North East of England, (see Wynarczyk and Renner, 2006) and to our knowledge the first empirical investigation of its kind in the North East of England.

By extension, data on female participation in industrial R&D at a regional level is minimal. The empirical survey carried out in the original paper showed that that both trends, relating to R&D expenditure and the gender in R&D employment in the North East were particularly disappointing. 45 per cent of the SET firms surveyed had no employees with specific responsibility for R&D and over 91 per cent had no female R&D employees at all. It showed that, confirming popular perceptions, women were far more likely to hold managerial positions in human resources and marketing than in R&D or science and technology related positions, (Wynarczyk and Renner, 2006). The results of this paper demonstrate that women working in SET related companies are indeed less likely to have scientific qualifications, yet their qualifications are related to the positions they hold – women are more likely to have HR and marketing related qualifications than male personnel. This suggests that the frequent headlines suggesting that well qualified women are forced into administration or secretarial work, particularly in male dominated sectors such as SET, is incorrect and in fact, women do follow a clearly structured career path linked to their chosen field. Indeed, notably in the chemicals sector, women in the North East with the appropriate scientific qualifications do find themselves working in the appropriate field and in an appropriate position and there is some evidence that women have actually moved from elsewhere in the UK and abroad to the North East of England in order to work in that sector. Interestingly, a number of women working in the sector had no formal scientific qualifications, but, as with both men and women in numerous other sectors

in industry as a whole, placed a greater emphasis on their work experience. This suggests that formal qualifications, though undoubtedly important, are not the only factor in the equation.

Other factors such as age and family commitments clearly have an impact on career progression. In the survey for this paper, 32 per cent of the women in industrial research were single compared to none of those in non-scientific positions. Female researchers tended to be younger, a reflection perhaps of the well-documented SET 'leaky' pipeline where women progressively leak out of the SET workforce at each level, leaving an ever-narrowing pool of female employees. Likewise, only 26 per cent of women in industrial research had children compared to 67 per cent of women in non-scientific positions. Again, this may be a reflection of both the fact that female industrial researchers tended to be younger and a more general feeling that having children would be detrimental to their career in research, with some women in the survey clearly stating this was a factor in their decision not to have children. Taking into account the much-criticised, lack of basic childcare facilities in the UK, it is clear that family circumstances are a very strong factor in the career progression of women in industrial research in the UK.

Other factors include a lack of confidence and self-esteem, which may originate in perceptions formed at a young age of what constitutes 'male and 'female' work. It is clear even now that these perceptions remain very strong and employers make clear reference to the fact sectors traditionally dominated by a male workforce continue to see little to no applications for vacancies from women, with strong implications for schools and career advisors.

All of these factors combine to paint a more complicated picture than the traditional perception of overt discrimination against women and female career progression. Indeed institutional sexism largely appears to have been successfully tackled in many industries, through a combination of changes in attitudes from society as a whole and through legislation. More subtle issues such as confidence-building, widening career horizons and breaking down occupational stereotypes at school level will take many years to achieve. Yet it is obvious that the barrier that most women have greatest difficulty in overcoming is reconciling the ideal of 'having it all' with the reality of work-life balance issues. Many of the women in this survey who enjoy a successful career in science and research freely admit that they had to make considerable sacrifices in order to achieve this. To them, it appeared that there was no obvious way to reconcile work and life and that one had to be pursued at the expense of the other. Whilst equal opportunities and work-life balance policies, childcare facilities and a flexible work schedule would all appear to offer a more attractive environment for female career progression, it would seem that these policies aid the recruitment and retention of women, mainly on part time basis, and not necessarily their career progression. In the long term, as has historically been the case, employees (male or female) with the greatest focus on their work and the least number of external commitments are the most likely to progress and succeed in that industry.

Labour Force Survey (LFS) data shows that a vast majority of managerial and senior positions in the UK are full-time. More formalised, affordable and accessible childcare facilities (e.g., full-time crèches and after school childcare facilities) are needed to encourage women to take up full-time position. It should be noted that

50:50 men to women is not equality if all senior managers are men and most junior staff are women. Women need to be more visible in senior and managerial positions. Therefore, policy is needed to encourage women to participate fully in the scientific labour market and at the highest levels in particular.

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