



Meta-analysis of gender and science research

RTD-PP-L4-2007-1



D31 – Country report Portugal

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March 2009

1. Introduction

In Portugal, especially starting in the 1970s, women's studies had implications on the emergency of the concept of gender and the feminist criticism to the prevailing models about differences between sexes. Until then, women had been absent from scientific research both as subject and as object. Feminism brought more reflexivity to the scientific thinking.

After the 25th of April 1974, because of the consequent political openness, several innovating themes of research emerged, together with new concepts and fields of study. However, as far as gender and science relationship is concerned, such studies especially concentrate on higher education institutions. The feminist thinking seems to have two main objectives: to give women visibility, on the one hand, and to denunciate men's domain in the several fields of knowledge.

In 1977, the "Feminine Commission" is created and since then it has been publishing studies on women's condition and contributing to the enhancement of the reflection of female condition at all levels.

In the 1980s, the growing feminisation of tertiary education (both of students and academics), favoured the development of women's studies, especially on their condition within universities with a special focus on the glass ceiling, despite the lack of statistical data by gender, thus making difficult the analysis of women integration in several sectors, namely in educational and scientific research activities. Other agglutinating themes are family, social and legal condition, work, education, and feminine intervention on political and social movements.

In the 1990s, Women Studies are institutionalised in the academic context with the creation of the first Master in Women Studies in the Universidade Aberta (Open University), in Lisbon. In 1999, the first Portuguese journal of women studies is created – "Faces de Eva". Seminars, conferences, thesis, journals, and projects on women's studies are more and more common. However, results and publications are not so divulgated as they should be, because of lack of comprehensive and coordinated databases.

2. Analysis by topics

2.1. Horizontal and vertical segregation

Research questions

It is one of the main areas of research in Portugal. Essentially two issues have been considered:

- The analysis of vertical gender segregation in educational and professional fields, having reflexes on women professional career progression with special attention to men's power in control positions and the glass ceiling.
- The analysis of horizontal segregation, special in higher education (teaching and research) where women have less visibility than men, and the under-representation of women in technology and technological careers.

Research in this area mainly focuses on description, showing the under-representation of women in certain scientific areas and senior positions. Nevertheless, the studies that analyze horizontal segregation in the field of education adopt a more analytical approach which focuses on the analysis of the mechanisms of reproduction of gender stereotypes, especially socialisation, influencing educational and career choices.

Research approaches

Most analysed studies concentrate on the state-of-the-art and/or give a conceptual framework to a better understanding of the problematic under analysis. Some of them draw on compilation of statistics, which typically relate to just one year time. They are essentially descriptive.

Many studies follow a qualitative approach, based on sociologic or ethnographic methods, mostly interviews, and also biographic researches. Some case studies can also be found, also based on a qualitative paradigm as opposed to a positivist paradigm. Furthermore, a great deal of these studies are of a theoretical and conceptual nature and focuses on the contribution of feminist criticism to the reformulation of science namely in what concerns barriers between disciplines.

Empirical quantitative researches can also be found, two researches combining quantitative and qualitative methodologies. Quantitative studies are essential of non representative samples. However, two studies show representative samples: one of them is the first and largest extensive enquiry to Portuguese scientists about the ways they regard their field of activity. This enquiry was carried out under the patronage of Calouste Gulbenkian Foundation. The second one, the time coverage of which is 2002-2003, compares women situation in Salamanca and Oporto universities at three levels – students, professors and participation in managerial and representation in upper representation in university.

Some biographical researches are also to be mentioned, because of their interest to a deeper understanding of experienced segregation and reflect on strategies and convictions that have been important to attain a successful career, overcoming common constraints.

Findings

Taking into consideration data analysed up to now, the situation in Portugal in relation to horizontal and vertical segregation in science can be summarized as follows:

- In Portugal, women are “pillars” in the educational and professional fields. However, equality of opportunities, participation and recognition remains an uncompleted process.
- Despite a massive presence of women in science, at present, in Portugal, and their important role in the scientific community, gender representations are embedded in organisations and in the dominant culture of science. Thus, illusive ways of discrimination persist and men are mostly in superior, controlling positions.
- Discrimination persists, namely in ICT and other fields of knowledge traditionally considered for “males”. However, women are increasingly overcoming gender stereotypes and enter in professional domains where men predominate.
- Traditional concepts of gendered educational aims and primary socialisation still influence educational and career choices.
- Women’s segregation in science has been linked to a scientific paradigm where woman is considered as the “other”.

Some of these studies deal with issues related to other topics (identity, young researchers mobility, feminisation of some fields of knowledge). The summary of their results is developed in the corresponding topics.

Gaps

The analysis is hindered by a shortage of statistical information, in particular:

- The lack of sex-disaggregated historical series about university graduates, academic staff and researchers.
- The absence of regular, official surveys of university graduates and doctors.
- The complete lack of panel surveys which make longitudinal analysis possible.

The analysis centres mainly on academia. The studies analysed so far do not show research in the private sector, with the exception of medicine.

There are no longitudinal studies about gender and scientific careers.

A large part of the research effort is aimed at the compilation of data. Analytical research, as will be shown in the subsequent topics, is still scarce and fragmented. The same occurs with the development of the gender indicators.

2.2. Pay and funding

Research questions

Apart a publication that analyses the paradoxes of female employment in Portugal in general, and does not concentrate specifically on scientific professions, this line of research has not been developed in Portugal. This topic is, nevertheless, pointed out in some studies, as a consequence of difficulties women experience in career progression and access to top positions.

In the above study, the following question is dealt with:

- The gap between what is stated in the general law of the country – the Constitution of the Portuguese Republic, and the reality that shows poor rates of pay for women in general, when compared to men.

Research approaches

The above publication is an analysis based on statistical data from EUROSTAT, CITE – the Portuguese Commission for Equality in Work and Employment, and CIDM (now CIG) – Commission for Equality and Women Rights. The study analyses the paradoxes of female employment in Portugal - professional segregation, segmentation of female employment, and sexual division of work, as well as political participation.

Findings

Despite some evolution, women are mostly in poorly paid occupations and seldom ascend to decision taking positions. As far as women in university careers are concerned, some of the studies under analysis show that only a very small minority of the Portuguese women with a PhD degree reach a professorship, a situation that has reflexes on the access to top academic positions. Additionally to career progression, Portuguese women have to face wage inequalities.

Gaps

In Portugal this topic of research has not even started. There are no recent empirical studies about gender pay gap and gender discrimination. Furthermore, there are no studies that analyse inequality in the access to funding either.

2.3. Stereotypes and identity

Research questions

This is the topic that has generated the largest amount of publications in Portugal. Two issues are dealt with from a multidisciplinary approach:

- The social construction of science. From this perspective, science is analysed as a social construction, in a society controlled by men, where the “masculine” dominates the “feminine”. The traditional paradigm of science – positivist – is viewed as a biased one, where “rationality” does not take diversity and reflexivity into consideration. The importance of feminist criticism is highlighted. The following lines of research have been identified:
 - Conceptual reflections about epistemology of science from a gender perspective, connecting stereotypes with scientific paradigms. These studies stress the importance of the emergence of the gender concept and the feminist criticism.
 - Studies that critically analyze specific scientific fields in which the supremacy of ‘the masculine’ over “the feminine’ is most evident. A paradigmatic example would be the findings of the Development Genetics, Neurobiology, Linguistics, Psychology, and Sociology that reveal a complex reality, stressing the importance of the interaction between genes and the environment, as opposed to the biologic determinism.
 - Studies that point out the perpetuation of stereotypes through women’s educational processes, and the power of tradition and social representations in determining feminine professional choices. Thus girls have been oriented to more general than technical courses.
- The social construction of identity and its gender biases. This issue has not generated so many studies as the social construction of science. The social construction of identity is considered as a result of primary socialisation, on the one hand, and as the result of traditional concepts of gender which are embedded in institutions and that have been influencing attitudes and behaviours about gender roles in science, not only by youth but also by a great amount of adults.

In general, conceptual contributions about epistemology of science prevail, and to a lesser extent, studies dealing with the critical revision of conceptions of educational aims, teaching practices and teaching material in school. However, there are also more empirical studies that attempt to explain why some individuals go beyond gender stereotypes and enter in professional areas with a much larger presence of “the other”.

Research approaches

The social construction of science

The majority of the studies are of a conceptual nature and focus on the epistemology of science, in particular on the epistemological status of women studies, the point of view of the knowledge producer, as well as the political dimension of knowledge. In general, it is argued that women marginalisation in science is linked to a traditional positivist paradigm, where rationality does not give place to diversity. This state of affairs calls for a renovation of science paradigm, for which a great contribution has been given by feminist studies. It is believed that the emergence of such renovation, where different disciplines interface and multi and transdisciplinary approaches are followed, will allow the recreation of women, men, and science. These publications come mainly from Sociology and Psychology, but also from History (historiography), Arts, Health Sciences and other fields of knowledge. There are empirical researches, most of them following a qualitative approach, because their main interest is to reach a clear understanding of women situation. However, reports from empirical researches are found, normally of non representative samples. Some studies analyse compilation of statistics mainly produced by governmental services. A few studies took a mixed approach – both qualitative and quantitative. Also through a compilation of statistics, two contributions deal

with the progressive feminisation of medicine, a universal phenomenon. According to the authors, it can be the result of some disinterest by men who seem to prefer professions with more visibility, with more autonomy, and with better financial opportunities. One publication even presents the profile of the future doctor in Portugal – about half of them coming from high-middle class, and 69 percent females.

The social construction of identity

Contributions in this field are mainly of conceptual/state-of-the-art type, although empirical qualitative researches can also be found, some based on the analysis of statistics. The methods more used are biographical research, content analysis, and interviews. A few studies follow a mixed approach – qualitative and quantitative. Most studies come from Sociology and Psychology and deal with the reproduction of traditional cultural gender stereotypes, a consequence of primary socialization and of the power of men's beliefs on women. From this perspective, some studies analyse processes of social construction of masculinity in contexts of masculine numerical and symbolical dominance and on the specificities of the masculine identity that emerge in these contexts. Most studies stress the need to critically analyse the use of educational resources that contribute to a gendered conception of science among young students and seem to aim at perpetuating gender stereotypes in education, even if in an illusive way. Moreover, from a historical point of view, some studies conclude that the late arrival of women into higher education is due to different conceptions of educational aims that have been universally dominating. It is also emphasised that women's education process throughout the 20th century gave them the tools for reflection on themselves and the world.

Findings

The main Portuguese contributions to the study of stereotypes and identity in science can be summarized as follows:

- A large and deep conceptual debate about epistemology of science can be observed. Many studies converge in the idea that epistemological and methodological transformation brought about by the critical movements within psychology and sociology, influenced by the feminist perspectives played a decisive role in the deconstruction of the dominating paradigm of traditional science.
- The power of tradition in professional choices for women still persists. Although there has been a considerable change in the latest years, not only gender but also socio-cultural family backgrounds influence the courses that are chosen by young students. Thus, most female students and students from less advantageous social class origins choose general courses, while students from higher social classes chose scientific and technological courses, which contributes to the almost absence of women in professions traditionally characterised by a strong masculinisation. In technical and scientific professions, women are mostly from higher social classes than men.
- Gender representations are embedded in the organisational forms and in the dominant culture of science. Both scientists and scientific institutions have contributed to the perpetuation of stereotyped gender representations, in particular in what concerns the representation of women as a sexed category. This can explain the fact that in higher education, Metal Mechanics, Electricity and Electronics, Civil Engineering and Informatics present lower feminisation rates.
- As far as education is concerned, many educational resources keep contributing to the maintenance of stereotypes and to the enhancement of patterns of behaviour for girls and boys. Sometimes representations of young girls and women in professions and/or activities of minor prestige can be observed, as well as the absence of representations of young girls and women in professions in more powerful professions, with more social and economic value.
- Individuals that surpass traditional gender stereotypes and assume different social, family, and professional positions, construct their gender identity in labour contexts, based not only on their own expectations, but also on the expectations of their colleagues.

Gaps

The conceptual debate reveals a certain discontinuity and thematic dispersion. Two lines of reflection are constant: the social construction of dominating models of femininity and the way they are created and articulated with reality. However, there is, in general, a lack of consistent theoretical framework. Also when issues like validity, objectivity, and rationality of scientific paradigms are questioned, there is lack of consistence in the explanation of the new paradigm proposed in order to gain insight into this domain.

Studies are scattered in the sense that there is not a defined line of research, and the institutionalisation of women's studies in some Portuguese universities do not seem to have added significantly to the understanding of the situation neither to the situation of women in science, nor to the factors that influence more decisively in the educational and professional choices of young boys and girls.

There is not sufficient empirical research on several important issues, like the dynamics that make some individuals surpass traditional stereotypes and chose professional fields dominated by the "other" gender.

Although criticism is made to educational resources, alternatives pointed out are scarce, if any.

Studies prioritise women's condition, mainly from the 1970s, but they failed to deal with the problematic of the relationships between men and women in the historic process.

No publications have been identified about cognitive skills, which is an area of research not developed in Portugal.

2.4. Science as a labour activity

Research questions

In this topic, the analysis of working time and work/life balance is mostly mingled with the analysis of personal and professional life course. Generally speaking, studies particularly emphasise three questions:

- The historical analysis of female scientists who excelled in fields of knowledge traditionally linked to males, and the struggle they had to endure.
- Biographical studies of contemporary women, with the aim of illustrating the relation between the professional and the private sphere.
- The analysis of gender discrimination in scientific careers, principally in academia, sometimes connected with the need for mobility.

This line of research is mainly concerned with theoretical issues, although some empirical research and mixed research approaches can be found.

Research approaches

Most studies about discrimination in higher education are of a conceptual nature based on theoretical contributions, sometimes starting from the analysis of the compilation of official statistics. Some of this literature deals on discrimination in general, other treats specific areas like the Arts, Biology, and Architecture and Town Planning, where women seem to be far to reach even numerical equality. In a number of studies the total unbalance in sex division of housework and children and sometimes elderly care is pointed out as one of the reasons why women cannot progress in their careers as fast as men do.

There is one comparative study based on an empirical quantitative with a representative sample, the aim of which is to prove that despite the massive presence of women in higher education as teachers or researchers they still remain invisible in their professional condition. This fact is due to the glass ceiling which is kept over scientist women professionals and the

masculine fortress that controls academic management and power. However this study reports just to one year, which does not allow a diachronic analysis of the situation.

The historical and biographical analysis of female scientists has produced the larger number of studies. They focus on the biography of well-known women in science, in different fields of science especially in the fields of natural sciences and experimental sciences, and also in the social sciences. This type of biographical analysis is carried out by means of content analysis of historical documents and related literature. In the case of contemporary women, interviews are also carried out. These studies try to explain the success of some women in scientific professions despite the existing discrimination.

Many of the studies that analyse science as a labour activity do not focus specifically on this topic, and it is often mingled with other reflections and analysis relating to women discrimination in scientific professions. Besides, the empirical studies about the situation of women in the scientific system in Portugal are scarce and non-systematic. Except for the biographical researches; studies often result from the analysis of existing statistics and/or qualitative fieldwork. Although there are examples of women who overcame traditional barriers, these studies often focus on the analysis of women's perceptions of the barriers and difficulties they face when trying to achieve academic success.

Findings

The main Portuguese contributions for this topic can be summarised as follows:

- Women presently play an important role in the Portuguese scientific community, having greatly contributed to knowledge creation, namely in the field of technology. However, they are still discriminated and seldom reach top position.
- In most fields of knowledge, research teams only make sense when both men and women have their place.
- The biographical studies about women in science both in the past and in the 20th and 21st centuries explain their success in scientific careers in terms of social networks, family help and the use of personal resting time to work. It is also mentioned that in technical scientific professions women are mostly from higher social classes than men. The interest towards these women appears also to be linked with enhancing their visibility as women in science, providing female role models and avoiding the reproduction of stereotypes.
- Difficulty in harmonizing working time and personal life duties, due to a total unbalance in sex division of housework, children and sometimes elderly care is often pointed out as a barrier to career progression. The same happens when mobility is necessary for young assistants to do their PhD abroad. In this case, quite often women self-discriminate when they have children and their husbands do not want to accompany them.

Gaps

The theoretical debate prevails in the analysis of science as a labour activity. There are only a few empirical studies about the organization of scientific work, the uses of time or the work/life balance.

2.5. Scientific excellence

Research questions

Only four Portuguese articles and one book that can be classified under the topic “scientific excellence” have been identified. All of them deal with scientific productivity. The studies concern the following issues:

- Analysis of the concept of scientific excellence, which reproduces gender bias.
- Analysis of discrimination against women in developed countries as compared to developing countries.

- Examples of female scientific excellence.

Research approaches

Two studies are conceptual, state of the art, and deal mainly with conceptions of science linked to male patterns. They mostly reflect on and discuss literature, both Portuguese and from elsewhere. The other studies used mixed approaches, although they are mainly qualitative, using biographical methods, interviews, and content analysis of documents. These studies argue that women are evaluated as the “other”, distinct from the masculine “me”. Thus, it is claimed that a significant transformation in women’s condition implies a transformation in the aims, and methods, as well as a different conception of society, otherwise women risk being assimilated.

Examples of females who attained scientific excellence, both in the past and in modern times, also mention the support of their families and also how they sometimes had to struggle to harmonise their personal and professional lives.

Findings

The main findings are the following:

- Especially since the revolution of April 1974, women have been gradually increasing their power to change scientific and technological knowledge in its aims, methodologies and strategies, in order to lead to a different conception of society.
- Feminism has produced a method of thinking which is fundamental for the science reformulation, namely in what concerns the barriers between disciplines. However, men persist in using illusive ways of affirming themselves as superiors, as the only pattern of science and technological activity.
- There is a greater discrimination against women in scientific research in developed countries than in developing ones because in developing countries links between research and the productive system are weak, on the one hand, and because in countries which were late to industrialize the development of science took place at a stage when women’s economic and social participation was more acceptable.
- Rationality has denied the difference, does not allow diversity, separates and divides to better control. However, occasionally women’s emergencies in the knowledge world already happened in the 1700s. More recently, three examples of excellence in scientific productivity came from women who won the Nobel Prize – Marie Curie, Göppert Mayer, and Lise Meitner. Although they were remarkable, they had to endure a struggle to overcome barriers and reached a position which was persistently denied to them just for being women.
- The requirement for mobility of young researchers may act as a constraint for a balanced gender representation and progression in the levels of scientific career in the case of women who have young children and do not want to leave them and their husband do not want or cannot accompany them. Policies to implement structures to support such women should be implemented.

Gaps

There are no consistent, systematic studies that analyse barriers to career progression of women, either within academia or in other institutions, public or private. Equally, there are no analysis covering several evaluating processes like the gender constitution of panels from the Portuguese Foundation for Science and Technology (Fundação para a Ciência e Technology). There are no studies on definition of excellence neither on institutional practices of evaluation.

2.6 Gender in research contents

Research questions

Most studies on gender in research contents are conceptual contributions. The following perspectives can be defined:

- A historical perspective, aiming to give a biographical account of the Portuguese historiography about women history and gender, from the 16th century, with a special insight into the 19th and early 20th centuries.
- An epistemological perspective, which analyses the orientation of knowledge production, the political dimension of knowledge and the contributions that women's studies and the feminist perspective have represented to the creation of a new scientific paradigm.
- A sociological perspective that studies biographies of recent female scientist women and researchers highlighting their innovative contributions and their strategies to overcome existing barriers and discriminating behaviours.

Research approaches

Research approaches in this topic are mainly conceptual, biographic and ethnographic researches, although some empirical qualitative studies and/or empirical quantitative researches can be found.

In the history of science and in the sociological perspective there are biographies of women in Portugal mainly from the midst of 1970s till present, stressing their struggle to do scientific research and the contribution they gave to several scientific fields. Some authors chronically divide the history of women's studies in three periods: the 1970s, the 1980s and from the 1990s until the present times. It is argued that studies on women must be contextualised, because they cannot be dissociated from the social class where the "feminine" is included. Besides, in a given historic context, the feminine reality coexists in several ways, and it is assumed that all knowledge about the social is historically contextualises and ideological compromised.

In what concerns contributions from an epistemological perspective, they mainly consist on bibliographical reviews, both of Portuguese and international literature, focusing on the contribution women's studies brought to the construction of new scientific paradigm. Under this perspective, notions of absolute subjectivity are not postulated; the way the researcher is implicated in his/her research is not denied; it is not assumed that the object of analysis is passive when, on the contrary, it is in constant changing according to the observer, and it is recognised that relationships that are established between research agents and the person or groups where attention is focuses are important for the context analysis, in the sense of seeing them in the light of power relationships which go through the very research projects. The main contributions come from social science, psychology, health sciences, and arts.

Findings

The main findings are as follows:

- A large amount of publications focuses on epistemological and methodological issues, mainly on the contributions brought to the scientific analysis, as opposed to traditional scientific methodologies, of a positivist paradigm.
- The national historiography production of the end of the 19th century and the beginning of the 20th century has privileged the study of the feminine condition. However, it did not analyse the relationship between men and women in the historic process.
- In Portugal, women's studies is a field of research that has developed in recent years, due to the political freedom of the revolution of April 1974, resulting in several research themes, new concepts and innovation?

- Three periods can be considered: in the 1970s, a phase deeply influenced by the massive entrance of women in higher education, new areas of study emerged, giving visibility to women, as well as methodological innovation, and an interest for historical periods that had been neglected during dictatorship; in the 1980s, objectives, methodologies and resources were more rigorously specified, the great themes being family, education, work, education and feminine intervention in social and political movements; in the 1990s, women's studies were institutionalised in universities as a specific area of the academic sector.
- The amount of information relating to the feminine ideal of education concerning the different social groups is quite different, a much greater reference being found in what concerns the noble or bourgeois young lady, as compared to popular classes' girls.
- It is important to question social representations that interconnect gender and technology, namely to analyse educational informatics products in order to avoid perpetuation of gender stereotypes.
- In the field of health science, sometimes scientific knowledge is translated to common understanding creating meanings about what women should or should not do, in a discriminating way, and often media actively participate in this process.
- The asymmetric logic underlying ideas of difference between sexes persists in the scientific thought.

Gaps

Many articles discuss epistemology and the relevance of new methodologies in the deconstruction of the prevailing positivist paradigm. However, they do not seem to have a great impact on other fields of research. Besides, these articles did not “dare” to go deeply in this issue and do not evolve to approaches like Complex Systems Approach or even systemic approach, since social systems are highly complex and fail to be “captured” by mere positivist methodologies.

In what concerns media and their reproduction of gendered stereotypes by transforming scientific findings into commonly understandable concepts and spreading gender stereotypes, studies are scarce, non systematic and under represented.

Any contribution about gender and specific scientific fields (gender and ICT, or technology, or medicine...) could be found.

2.7 Policies towards gender equality in science

Research questions

In the works that have been analysed so far, only one article has been found dealing with this issue. It focuses on mobility of Portuguese PhD students, their motivations and interests. The study tries to show the implications of mobility on individual lives and on the process of their scientific development, as well as to discuss policies in this domain.

Research approaches

The above study uses a mixed approach. It compiles official statistics and it is an empirical research, using quantitative techniques.

Findings

The above mentioned study reached the following main findings:

- Despite the political valorisation of mobility, it is necessary to more accurately reflect on the common sense assumptions that mobility will solve several problems, and will result in a good scientific awareness.

- Mobility is not always the result of personal choices. Neither is it an indicator of the scientific development level in a given country.
- Unless structures are thought of, women risk self-discrimination when they have family obligations.

Gaps

Being a new area of research in Portugal, studies are very scarce and do not cover issues like gender mainstreaming measures and positive measures for scientific equality of gender.

3. Conclusions

Stereotypes and identities is the topic that has generated the largest amount of publications in Portugal. Science is analysed as a social construction, and the male domination over the female in a society controlled by men is stressed. The traditional positivist paradigm of science is viewed as one of the reasons to the maintenance of male domination in most fields of research. The contributions from the feminist criticism and women's studies to a new scientific paradigm that brought new approaches and new methods, as well as the emergence of the gender concept are highlighted. Educational conceptions, the power of tradition and social representations are considered the main reasons for the perpetuation of gender stereotypes which determine feminine professional choices. As for the social construction of identity, it is viewed both as a result of primary socialisation and of traditional concepts of gender, embedded in institutions, thus influencing attitudes and behaviours about gender roles in science.

Horizontal and vertical segregation is the second topic to generate more Portuguese scientific production. Analysis has most incidences on higher education, where women have been lacking visibility and are underrepresented in technological careers

A growing interest on science as a labour activity can also be noticed. Special attention is given to the analysis of working time and work/life balance, which is often mingled with the analysis of personal and professional life course. In this line of research, the main emphasis is on three issues: the historical analysis of female scientists, biographical studies of contemporary women, and the analysis of gender discrimination in scientific careers, mainly in universities, sometimes connected with the need for mobility.

Gender in research contents shows the Portuguese historiography about women history from the 16th century, with a special insight into the 19th and early 20th centuries. From a sociological perspective, there are biographies of recent female scientist women and researchers who overcame traditional barriers and gave innovative contributions to their scientific fields.

Only a few studies were found on pay and funding, and scientific excellence. Also studies on policies towards gender equality in science are practically inexistent. Cognitive skills have no publications at all.

In all topics, research approaches are mainly theoretical; some are collections of official statistics, although some empirical research can be found.

The following main gaps can be identified:

- There are few empirical studies with methodological consistence.
- There is a lack of consistent lines of research, instead of fragmented contributions.
- There are no empirical studies that unveil processes and strategies that contribute to the maintenance of women's segregation in the access to decision making positions.
- Contributions come mainly from the social sciences and psychology. Only scarce literature from health sciences, arts and biology could be identified.
- There is a lack of studies concerning the private sector.

4. Main biographical references

Horizontal and vertical segregation

Cutileiro Índias, M. A. (1987) 'A mulher, a universidade e a investigação científica - experiência vivencial', *Cadernos Condição Feminina - Proceedings of the seminar A mulher e o ensino superior, a investigação científica e as novas tecnologias em Portugal (Women and higher education, scientific research and new technologies in Portugal)*, vol. 21, pp. 51-57

Jesuino, J. C., Ávila, P., Carapinheiro, G., Firmino da Costa, A., Machado, F. L., Patrício, M. T., Stoleroff, A., Vala, J. & Amâncio, L. (ed.) (1995, *A Comunidade Científica Portuguesa nos Finais do Século XX*, Celta Editora, Lda, Oeiras.

Reis, A. L. Rosa Valente, M. J., Amâncio, L., Patrício, T., Santos, C., Silva, L. & Araújo Costa, H. (2001), *Women and science: Review of the situation in Portugal*, European Commission, Helsinki Group, Bruxelles.

Vaquinhas, I. (2002) 'Linhas e investigação para a história das mulheres nos séculos XIX e XX. Breve esboço'. *História*, vol. 3, III Série, pp. 201-221

Vaquinhas, I. (2002) 'Impacte dos estudos sobre as mulheres na produção científica nacional', *ex aequo*, vol. 6, pp. 147-174.

Pay and funding

Perista, H. & Silva, A. (2004) *Science careers in Portugal*, CESIS (Centro de Estudos para a Intervenção Social), Lisboa.

Stereotypes and identity

Amâncio, L. & Amâncio, L. (2003) 'Gender and Science in Portugal', *Portuguese Journal of Social Science*, vol. 1, no. 3, pp. 185-198

Vaquinhas, I. (2002) 'Linhas e investigação para a história das mulheres nos séculos XIX e XX. Breve esboço'. *História*, vol. 3, III Série, pp. 201-221

Cardana, I. (2005) 'Electrotecnia e Informática: dinâmicas de género em ciência e tecnologia', *Revista de Antropologia Experimental*, vol. 5, no. 14, pp. 1-20.

Science as a labour activity

Amâncio, L. (2005) 'Reflections on science as a gendered endeavour: Changes and continuities', *Social Science Information*, vol. 44, no. 1, pp. 65-83.

Perista, H. & Silva, A. (2004) *Science careers in Portugal*, CESIS (Centro de Estudos para a Intervenção Social), Lisboa.

Vicente Mosquete, T. & Trejo Jiménez, M. C. (2007) 'La situación de la mujer en las universidades de Salamanca y Oporto: La conquista femenina de las aulas frente al techo de cristal laboral y a la torre blindada masculina en la política universitaria', *Ex aequo - Revista da Associação Portuguesa de Estudos sobre as Mulheres*, vol. 15, pp. 21-44.

Scientific excellence

Janeira, A. L. (1987) 'Bloqueios mentais à emergência da mulher na comunidade científica ', *Cadernos Condição Feminina*, vol. 21, pp. 135-145.

Amâncio, L. (2003) 'Theoretical and epistemological implications of gender studies for the feminist theory ', *Faces de Eva*, vol. 9, pp. 29-34.

Gender in research contents

Vieira da Fonseca, M. M. (1987) 'O percurso até à universidade - pistas para descoberta de ideais de educação feminina', *Cadernos Condição Feminina*, vol. 21, pp. 81-91.

Fonseca, L., Araújo, H. & Magalhães, M. (2001) *Interrogando as metodologias qualitativas na sua contribuição para o campo educativo e de estudos sobre as mulheres* , Comissão da Condição Feminina, Lisboa, pp. 133-146.

Marques, A. M. & Amâncio, L. (2004) *Homens de Classe: masculinidade e posições sociais*, Portugal.

4.7 Policies towards gender equality in research

Rodrigues Araújo, E. (2005) *Passing time abroad : experience from PhD Portuguese researchers*, Universidad de Navarra, Pamplona, *Actas del Congreso de Cultura Europea*.