



Meta-analysis of gender and science research

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1. Introduction

The Finnish Gender and Science Studies are motivated by the feminist thinking. They are especially interested in problems, which women are facing during their academic careers. Women are not reaching highest academic posts as easily as men and are facing more hindrances.

During 1980s some women though acquired professorships especially in Social Sciences and this was a ground for Women's Studies as an academic discipline and a university subject. The founding of Women's Studies was inspired by a feminist thinking, which at time was interested in women's subjective experiences and an opposing of male stream thinking and oppressive male structures. Later during 2000s a second wave feminism entailed body and sexuality as a starting point of research. An institutional home of for Women's Studies were Finnish public universities offering academic posts and a room for free academic feminist thinking. To read this report it is important to notice that in Finland universities are public and free of costs. There are 20 universities and they encompass the whole country - so most of the higher research is done and possible only in the public state universities.

Besides the academic thinking the Ministry of Education and the National Council of Gender Equality were interested in a professional segregation in universities and wanted to promote equality policies to the universities. Also a historical professionalization of academic professions and pioneering women were discussed.

2. Analysis by topics

2.1. Horizontal and vertical segregation

Research questions

A general background for this research line in Finland is that most of the university students are women, but they are underrepresented in the university hierarchies, power structures and higher posts. The weakest situation is in Technology and Engineering studies, where there are few women students. The segregation studies are interested in:

- Women's opportunities and possibilities in scientific hierarchies and positions.
- A sexual distribution of university posts and a post graduate placement of women.
- Different kind of gender related gaps in the universities.

Research approaches

The segregation research is almost totally concentrated on and is about the universities and academia. It is done periodically occasionally, mainly late 1980s and early 1990s, and by individual university researchers. As a data mainly general statistics and register based data of the universities are used, which are easily available in Finland (today there is an advanced public KOTA-database of all Finnish universities). It has been possible to gather data of all people working and graduating at the universities. Also direct calculations of scientific posts and positions and conceptual literature reviews were used. In the field of Mathematics also PISA-study and other development project experiences were mentioned.

Findings

The results of the mainly statistical state of the art studies show:

- The role of women diminishes when moving up the official hierarchies of science. Half of university students and nearly half of university graduates are women but only 15%

of Ph.D.'s female (1982). When acting as university instructors women generally hold lower posts. The channels for women to broader scientific activity or academic recognition are weak. For example women are seldom seen as referees when professorial posts are filled.

- The percentage of women in all research posts is smallest in Engineering and Technical Sciences, in Biomedicine and in Natural Sciences. Women are overrepresented in Arts, Medicine, Social Sciences and Pedagogics. The scarcity of women among Natural and Technical Science students seems to be more the result of self-selection than conscious discriminatory practices. There are too explanations related to women's weaker interests to study Mathematics in schools in their younger ages.
- The greatest pressure for achievement and embarking on a scientific career coincides with the establishment of home and the family: between ages of twenty-five and thirty-five.
- Among licentiates and doctors, there are much fewer people with a working-class background and far more people with a white-collar background than at other levels of higher education. People from highly educated families graduate at a younger age and more often get better-paid jobs.

Gaps

The research is aimed only at the university sector and the private sector and other public research institutions are lacking. The research is not periodically systematic and is based on ad hoc interests of individual university researchers. Empirically studies are based on standard statistical cross cut analyses and there are no gender indicators, time series or longitudinal research settings. There are no common thematic frameworks or policy approaches (like gender mainstreaming) behind the research. There are no funding or programs of updating the segregation data, although the KOTA-database exists.

The comparative perspective is needed to overcome potential gender biases. Most of the empirical research on the problems and obstacles of women's careers in science focuses only on women, and the problems revealed are assumed to be particularly those of women scientists. From a methodological point of view, the validity of generalizations concerning women scientists must rest on the demonstration that they are gender specific. This implies the need for systematic comparisons of men and women scientists.

2.2. Pay and funding

Research questions

This research line is not developed in Finland, although in the field "political recommendations and options" a lack of funding especially for women researchers is usually mentioned (see 2.7). Three papers present here are related to:

- How the funding of Women's Studies can be organised?
- How the funding and the implementation of public sector sectoral research is gender related?
- How general research careers in connection with the funding are forming?

Research approaches

First, there is a working group memorandum of organizing women's studies at the University of Tampere, Finland, at early 1990s. The aim of the unit would be an organizing of researcher education with other discipline units and an information exchange of Women's Studies. The background brief is about a state of the art feminist research and its institutionalisation in the USA, a look at a history of Finnish women's studies and a bibliography of equality research and women's studies made in the University of Tampere during 1980s.

Another report, done late 1990s, is about Finnish sectoral studies in a field of gender equality studies and its volume and financing. In Finland, sectoral studies means publicly financed non-

academic research outside the universities. The sectoral study institutions were contacted and their actions were accounted. Later a survey was sent to contact persons. Finally a material was generated, which consisted of a list of new gender equality studies, a bibliography of studies and a list of target of financing.

Third, the Ministry of Education appointed a committee at 2004 to formulate a proposal for a strategy to develop professional careers in research, and ascertain how different funding bodies can contribute to the funding and development of the system; to make research careers more attractive, promote women's research careers and equality in careers in research.

Findings

The reports show that:

- The institutionalisation of gender studies is on its way, but still the financing of these studies is slight.
- Only 5 % of the total funding of sectoral studies was targeted to equality research in its larger meaning. A general recommendation of the sectoral studies report is that gender mainstreaming measures are needed universally to foster the gender equality research too. The gender sensitivity of research must be implemented as one of the main targets in all administrative fields of sectoral studies.
- The committee of Ministry of Education sees e.g. that the greatest challenges of research career are short terms of employment, difficulties in combining external research funding and career development, career advancement of women researchers, economic position of researchers and the volume of researcher training.

Gaps

Research targeted directly to gender pay gap and problems of research funding in the field of scientific action is not developed in Finland. There are no empirical analyses in this field, only state of the art policy reports.

2.3. Stereotypes and identity

Research questions

The social construction of science

A large quantity of studies of stereotypes and identity in Finland are mainly based on epistemological, philosophical and conceptual approaches done in the universities and the academia. An epistemological foundation of Women's Studies late 1980s and early 1990s, but also mid 2000s has been the mainstream. This epistemological thinking is practised especially in Social Sciences, like Sociology, Social Psychology and Social Policy. One interest behind this thinking is that the history of Women's Studies is short and its theoretical, epistemological and methodological backgrounds are not systematic and without controversies.

It was questioned in this process of developing gender studies:

- Why women were missing from the social research and its data and why men were representing the norm and humanity?
- What is a relationship between reality and knowledge among women and the women as subjects of scientific knowledge and everyday reasoning?
- What are methodological, epistemological, theoretical and practical tools to make the feminist research?
- Where one can find the sexual body (outside the heteronormativity) in Finnish Social Sciences and Cultural Studies?
- Besides the Women's Studies there has been discussions about a need of Men's Studies. What should one study in the future when describing the position, role and image of Finnish men?

Outside the social sciences the epistemological role of gender is discussed and questioned also among other disciplines, but only in single and coincidental publications. There are following research questions:

- The Women's specific knowledge and the subjective character of knowledge is discussed in a Geography, a History Science, a Theology, an International Relations Research and a Pedagogics.
- The feminism and the sexuality as a research concept is discussed in a Geography, a Psychology and a Folklore Studies.
- The gender as a social construction and a social system is approached in a Linguistic Studies, a Folklore Studies, a Psychology and an Archaeology.

There is one book (Husu and Rolin) arguing directly about Science and Technology studies and Gender. According the book there is a need to broaden the concept of gender to wider science structures, like financing, institutional structures, science communities, scientific networks etc.. The research questions are for example: does knowledge or science have a gender; or how does the gender appear in science, in the science institutions, in the producing of knowledge or in the everyday life of researcher. How the male domination affects the research questions, topics, methodologies and finally the concept of knowledge.

The social construction of identity

In this fragmented field of social construction of identity it is asked generally with relation to Gender Studies how gender could be understood in relation to the subjectivity, knowledge and agency. In some studies it is asked:

- Where and how one can find one's sexual body and gender?
- What are positions, roles and an images of Finnish men?
- Can a talented woman take advantage of her intellectual resources?
- What kinds are female students' technological orientations in the studies of technology?

Cognitive abilities

In this topic of cognitive abilities it is asked in two studies in Finland:

- Why girls are not interested in higher level mathematics and later in Technology, ICT and Engineering Studies.
- Why in Finnish high schools fewer girls are selecting long Mathematics and more are moving towards short Mathematics, although there are no factors which show that there are any intellectual differences between boys and girls in understanding mathematics.

Research approaches

The social construction of science

These studies are mainly epistemological and therefore philosophical and conceptual and are based on literature reviews and brain working. The epistemological reasoning leads to some more concrete research approaches, mentioned in chapter 2.4.

Women's Studies examine structures, a culture, a thinking, actions, communities and individuals from the gender perspective. What kind of places, positions, relations and possibilities these structures open up. The starting point is that in most of the occasions women's positions and possibilities looks to be weaker than men's. Here the so called second wave of feminism adds that the sexual body of Social Scientific Women's Studies is fixed with a gendered sexual action and its power relations. The Men's Studies asks epistemologically what is the significance of sex for man and how man produces or constructs his gender.

In many studies of other disciplines the research methods of Women's Studies are applied too as a general frame of reference. The male science and its masculine thinking are opposed and the truth is exposed from the perspective of a man. The central theme is to study women's position, equality and inequality in different social systems and cultural spheres. Also the subordinated women all over the world are of interests and how basic needs of these women can be fulfilled? Women's social movements and social divisions in industrial countries are also studied.

The social construction of identity

Here the second wave of feminism is bringing a gendered sexual action and its power relations in scene. Researcher of phenomenological tradition are especially interested in experiences of sexual body and gender related identities. Both post-modern and feminist epistemologies are used, while creating one possible theoretical synthesis about embodied subjectivity. The researchers are worked with representations of sexual bodies, gender and their connections with everyday lives of people, like in the academia and scientific work too.

In this field is there are three dissertation works, belonging to academic disciplines Education, Social Psychology and Cultural Studies. The feminist / Women's Studies frame of research and multiple empirical methodologies are used in analysing women researchers. In these studies women's thinking (and in the last one too men's) and understanding of different gendered life histories, cultural styles and subjective experiences are analysed. One dissertation work is interested in how girls are oriented towards multi-didactic technological studies of class teacher education. The research data was collected both with open and structured questionnaires. Both qualitative and quantitative methods were exploited to approach the research problem.

Cognitive abilities

The two research's in this field are state of the art analyses of why girls are not interested in Mathematics in schools.

Findings

The social construction of science

Due to it's epistemological character the findings in this field are related to qualities of knowledge, research methodologies, practical research concepts and research targets:

- Especially in the field of Women's Studies (and in the Men's Studies too), knowledge is socially constructed, there are seldom universal truths, and on the contrary, knowledge is always in relation with power. The feminist epistemology argues that the position of researcher is not neutral or outsider and the science is not separated from its objects. The researcher must be sensitive towards the plurality of people's everyday lives. The research is connected with the subjectivity of the researcher and with his/her position and characteristics.
- It is important to create tools and concepts to uncover the hidden gender and gender related structures, processes and constraints. The so called objectivity of science is based on masculinity and male power. Therefore the role of Women Studies is emancipatory and this means producing answers in questions of submission and liberation and alternative research practices.

The social construction of identity

In the later second wave feminism the sexual body is fixed with a gendered sexual action and its power relations. Researcher of phenomenological tradition are especially interested in experiences of sexual body, sex and gender. The gender differences are based on different styles and signs of bodies. Some see that the whole gender identity is created by building bodily performances.

- Like in the case of feminist Geography, the sexuality and a living environment are intertwined. The Geography of Tourism is based on social interactions and social articulations of needs, motivations, traditions and mental impressions.
- Men's Studies should concentrate on studying mainly men's experiences. On the basis of these experiences conclusions would be drawn regarding men's social reality. This kind of research can only naturally be conducted by men. These experiences could e.g. relate to social networks, a loneliness, male cultures, a technology, an eroticism and sex, a fatherhood, an adventure and vagabond dreams and a heroism.
- Occupational selection of the gifted women is very challenging and in many cases proved wrong. The environment behind development of giftedness culminates in home, school and opportunities to study, but could be compensated by women's activeness, high self-confidence and optimism. The importance of the childhood home gains emphasis as a developer of self-esteem. A special support for the talented women in the occupational selection procedure is needed.
- The gender system and social gender roles channel women to more feminine professions than to those Mathematics-intensive masculine professions. This is also in connection with social reproduction processes of gender, like Education and Pedagogics. Common stereotypes associated with technology become apparent as well; technology was quite generally perceived as belonging to the men's territory.

Cognitive abilities

The studies show that special support measures are needed in fields of attitude change, curriculum, educational methods and positive understanding of Mathematics. Positive role models must be found for girls too. The girls are minorities among college students of large courses of Mathematics in high schools and among technical students in universities and polytechnics.

- One reason for this stereotypical divide is an education and a didactics of Mathematics. Mathematics is a "cold and distant" mechanical science and lacks areas of creative thinking. Also teachers of Mathematics are treating gifted boys more positively than gifted girls.
- Boys' orientation to games, where different kinds of quantities, measuring and spatial action is typical, leads to the different orientations in Mathematics. There are also connections with parents' conceptions and attitudes of subject choice possibilities of their children.
- It is stereotyped wrong that women were not suitable for studies of Mathematics because of their nervous system and intellectual abilities. The students' attitude towards technology clearly mirrors the idea that both genders are equally capable of mastering technology.
- It is possible to pay more attention to female students' special needs, i.e. the female point of view, than has been done so far when planning and carrying out technological studies.

Gaps

Despite the strong influence of feminism to Finnish social sciences and relatively large practice of epistemological thinking in Women's Studies, this has not led to "revolution in science". Women's Studies is one kind of sub paradigm in Social Sciences and there are lots of empirical applied research in Social Scientific Women's Studies, but this has not led to a number of empirical research in other scientific disciplines outside the Social Sciences. Also this has not led any large scale changes of male dominated hierarchies and practices of the Finnish science and university system. The position of Men's studies is weak in adding a perspective of social interactionism between sexes. Especially today it is recognisable that the Finnish university system is facing large scale structural changes but without a gender mainstreaming and gender policies or even without feminist objection.

Generally the scientific field of *2.3 stereotypes and identity* lacks almost totally empirical research practise. The research done is conceptual and some times there are state of the art outlooks and the research is motivated usually only by feminist thinking - not by empirical

research findings or by other alternative epistemological orientations - despite couple of separate dissertations. Also it is aimed totally towards academia and academic research practice.

The problem of getting women to study Mathematics and Technical Sciences is not solved. There are no large scale structural policies, only some development projects and quotas of student selection.

2.4. Science as a labour activity

Research questions

The research questions in this field are:

- Women's working careers and working obstacles in academia. A sex and a combining of the family role has been seen a problem in the women's research work and career promotions.
- Professional and a private identity ("femininity") and subjective experiences of female researchers, especially doctoral students, within the academic community are studied.
- Historical analyses of academic professional paths of women working in different professional fields, usually in connection with early stage and emerging academic education.
- Sexual harassment at some universities is studied as a part of national equality work.

Research approaches

The studies of women's academic careers are closely related to Women's Studies and Social Sciences (Sociology, Social Policy, Social Psychology). There are multiple standard type both qualitative and quantitative empirical approaches in this research topic, like asked letters, memory work group interviews, ISA-analysis, survey questionnaires and university register data's. Typical approaches of Social Sciences were used in analysing of women's university careers. Usual way of organising studies in this topic was let the women to tell their subjective feelings and experiences of being an academic woman. How she articulate, define and analyze his work as a researcher and how she constructs her subjectivity as a member of research community. Finally the Women's Studies and it's empirical practises are a paradigmatic challenge for the development of research approaches of general Social Sciences. Also the criticism of male science, "a theory without gender system", is necessary and important basis for these studies.

The analyses of academic / professional paths of women are usually based on chronological descriptions. Usually these women's are pioneers of starting phase of institutionalisation process of profession in question. Typically these professions are male dominated at their early historical development phase. The obstacles and hindrances the women were facing during this process are usually described. Also women's professional and academic contributions to the field are presented. Academic posts women vs. men are calculated too.

Findings

The studies show that the university is still male dominated, although it is easier today for women to achieve academic university degrees:

- All women share the common experience of being outsiders in the academic community. The women's narratives reveal that how particular fields and institutions restrict (or facilitate) research designs typically adopted by women researchers.
- The combination of work and family life is difficult. To become a mother in this kind of environment is risky from the perspective of further career. Having a family puts more strain on women, especially when the children are small.

- Still sexism and hidden discrimination continue in the daily life of academia, but the academic women continue to challenge this various ways. The sexual harassment clearly existed in the universities and the majority of victims were women.
- At the early stages of academic professionalization it was impossible for women to reach any remarkable positions and later too it was difficult to achieve both professional and academic posts too. This has affected the contents and paradigms of research too. But the appearance of women to the scientific field was an emancipatory question at the end of the 19th and early 20th Century and today the female professionals are self evident.

Gaps

The studies of scientific work and gender are usually based on women's experiences and feminist paradigm. There are no alternative approaches to study the gender in research organisations and related social systems, except traditional male stream descriptions of scientific work. Most of the argumentation is based on feminist presuppositions and not wide analyses and empirical studies of scientific work.

The studies of institutionalisation process are from incidental fields and except for two dissertations they are not very analytical.

2.5. Scientific excellence

Research questions

- In this field there is one article (Töttö), which revisits a common belief that males tend to get higher grades for their master's theses in the Finnish universities.

Research approaches

Töttö's article revisits a common belief that males tend to get higher grades for their master's theses by considering register data on 12453 students who graduated from the University of Jyväskylä between 1974 -1997. In the natural sciences, dominated by male students, both genders are granted higher grades than in fields dominated by females, the grades have to be standardised according to the mean of grades in each subject.

Findings

Töttö's data indicates that:

- Males more often choose the longer Mathematics course in school and succeed better in it than females.
- This could explain the gender difference observed in grades at the university level, assuming that there is a causal link between mathematical achievement and scientific reasoning. A small difference in favour of males remains even after standardisation.

Gaps

This field of study is not developed in Finland at all.

2.6 Gender in research contents

Research questions

This research field in Finland is discussing with conceptual questions of implementing Women's Studies and its epistemological background to concrete social research, its empirical settings, methodologies and argumentation. This has meant:

- Developing of Sociology from the feminist perspective and contents and how gender is produced in the fields of Sociology. What is the presence of women and sometimes men too in the contents of Finnish Sociology and Social Sciences. What are the roles and characteristics of female and male subjects in the scientific argumentation?
- In the Social Policy Science the Nordic welfare state has seen involved in the struggle between the genders and it is also partly responsible for the division of human reproduction. One can ask what kind of role feminism can have in the research of a welfare state.
- It is too a question of developing social work from the gender perspective. How the gender can be imposed to the practices of social work? How the customers are heard as men and women subjects? This is a crucial question of Men's Studies too when emphasising studies on being a man, a plurality of masculinity and male practises and structures of life.
- Single publications of implementing questions of Women's Studies to disciplines outside social sciences are published in fields of university Pedagogics, Communication Studies, Working Life Research, Law, Theology, Computer Science and Visual Culture.

Research approaches

The research has been conceptual and usually related to the academic feminist epistemology. At late 1980s studies were based on the first wave feminism and later during 2000s the second wave of feminism studying bodies and sexuality. The studies are usually based on literature reviews and brain working.

The developments of research contents are in connection for example with an institutionalization of the Nordic welfare state, ideologies of social policy and theories of equality. Also there are conceptualisations of gender in feminist Sociology of Knowledge.

Vehviläinen in her work has studied male computing pioneers' autobiographical accounts, women developers' oral histories, and an office workers' study circle with related interviews – and, fourthly, from the codes of ethics of international computing professionals' associations ACM and IFIP. The second aim of her has been to participate in the development of methodologies on gender and technology research. The computing professions inherited strict gender hierarchies and male experts and managers gained a status of yielding the objective truth.

Findings

- In the conventional Sociology gender is considered a little, but following themes and elements can be found: 1) gender roles and equality, 2) women's perspective, 3) gender and gender system and 4) men's perspective. The central gender difference was that women were caregivers and men were rulers.
- For the Policy Science the state is a subject of science and genders. The liberalist ideology and the strength of state fades out the gender and gendered social relations and marginalises the femininity. There are three main discussions behind the welfare state: patriarchy, reproduction and care and citizenship.
- In the theories of reproduction and care, the conceptualization of women is based on an asymmetry of gender relations. Now woman is an active subject, whose role is to take others needs into account. In the citizenship discourse the women are political actors and subjects, the gender difference is actualized in a private life, but too in a political sphere.

- Many of the social problems are gender related, like men's intoxicants misuse, criminality and homelessness and are not studied from the perspective of Gender and Men's Studies. There is too a need for feminist Social Work Research and theories. It is also a question of facing the customer's of social work as men and women.
- The ICT technologies, systems and user interfaces reflect the behaviour and thoughts of men. There has been little room for textualities developed from women's or any other particular groups' standpoints within information technology professions. Only some pioneering women, gaining independent positions, have had an opportunity to contribute to the ICT development.

Gaps

The epistemological debate of Women Studies has affected the development of Social Sciences in Finland, but the consequences have been slight in other scientific disciplines. The feminist ideas are predominant and interplay between women and men in the contexts of science is one-sided. A general position of Men's Studies is weak and pondering between Women's and Men's Studies is exiguous. The body and the sexuality as an epistemological concept of science is difficult or irrelevant to apply broadly - especially to applied sciences.

The gender related thinking is linked only to the academia and the development of academic disciplines. It is not interested in the research outside the academia or the Natural and Technical Sciences, Biomedicine and Life Sciences. This is astonishing, because for example the health care sector in Finland is female dominated and feminine branch.

The relations between female identity and information technology need to be supported. There is a need to understand the special relationship between femininity and technology.

2.7 Policies towards gender equality in science

Research questions

In this policy field of research, outside the epistemological recommendations, there are only committee and working group reports in Finland done 1982, 1986, 1997 and 2004.

- The first three done by the Ministry of Education and the Finnish Academy are interested in supporting women's research careers. There are remarkably less women in research posts than men in Finland and this is an example of social inequality and unfairness.
- The report of the Finnish Academy (1997) tries 1) to clarify and evaluate development needs to support women's research careers and to make suggestions to remove obstacles, 2) to examine the effects of hidden discrimination in science communities and 3) to prepare a proposal of a development plan "Women's research care in Finland 2010".
- Later 2004 the Ministry of Education appointed a committee to formulate a proposal for a strategy to develop generally professional careers in research and to make research careers more attractive, like promote women's research careers and equality in careers and examine how internationalisation should be taken into account at different stages of research career.
- Also the National Gender Equality Council (2006) makes some recommendations of developing national equality support work and Women's Studies in the universities

Research approaches

The committee and work group reports are based on statistical register data based reviews and group brain workings. There can also be conceptual and historical reviews of special factors affecting women's positions in the research.

Findings

The reports have found the following problems needing policy responses:

- Hindrances preventing women's research careers are connected with motherhood, child care, home works, spouses and reconciliation of work and family life.
- There are personal factors preventing career, like motivation and self-esteem, expectations of surroundings and expectations of role models.
- Hidden and open discrimination exists.

The reports have made the following Policy recommendations:

- A four-stage research career system should be developed for encompassing parallel research careers in universities and public research institutes as well as in other sectors when applicable.
- The database of research careers must be improved and a working group should be established to follow the implementation and impact of the recommendations.
- More women should be selected for posts of researchers, post-graduate studies and research administration, in some cases it is advisable to use quotas and age criteria's for the underrepresented sex and special measures to support women to apply research funding.
- Positive measures supporting reconciliation of work and family life are needed, one suggestion is to combine parental leaves with the research posts. For research stipendiates a special social security model must be developed, which is also connected with sickness benefits, family allowances and child care.
- Women's Studies connected with universal equality measures must be supported and courses related to equality issues should be included in the university studies.
- There is a special need is to develop mathematics and ADP-education, which attracts girls too and guide them to study technical and mathematical subjects.
- Women's internationalisation must be supported.

Gaps

The policy measure analysis of gender and science is exiguous, incidental and not systematic in Finland. Empirical background analyses are based on register data and targeted and more sophisticated empirical studies are not used in the highlighting of equality problems of gender and science.

This means that there are no institutional observatories, indicator lines, time series and targeted empirical policy options (benchmarking) research of analysing gender and science. There are just single policy reports based on brain working.

The goal of the policy development is just the academia and especially the academic careers of single researchers, there are said to be structural hindrances preventing these careers, but these are not analysed. There are no ideas of large structural policy changes, so the gender mainstreaming thinking is missing.

3. Conclusions

The mainstream of Finnish Gender and Science studies has been an epistemological project of building and institutionalising academic Women's Studies. Since mid 1980's there has been systematic efforts to develop Women's Studies from a multidisciplinary perspective to become an inseparable part of all academic disciplines. This has led to a strong position of Women's Studies as a sub paradigm in Social Sciences. The main epistemological idea of this project has been an emphasising of women's experiences and attitudes as a relevant source of scientific knowledge, so from a larger perspective the truth is said to be relativistic and subjective.

Another perspective here is an opposing of masculinities and male structures of science and scientific institutions.

Another strand in Finnish Gender and Science studies is a vertical and a horizontal segregation of university careers. It is a question of unequal career opportunities between men and women in the academia and an uneven division of men and women between certain academic disciplines, mainly the lack of women in Technical and Engineering Sciences is under discussion. These segregation studies are based on statistical cross cut studies of university staffs and state of the art analyses. Near these segregation studies are qualitative studies of "science as labour activity", where mainly women are expressing their feelings in working in academia. These experiences of women are usually related to a reconciliation of work and family life, weaker professional positions and career opportunities and opposing male stream thinking of scientific work and hierarchies.

Lots of studies are also aimed at thinking and analysing what is the gender in research context. This strand is in close connection with the epistemological project of Women's Studies, but is more concrete and actual when guiding and specifying the possible and relevant contents of Gender Studies desirable among the different academic disciplines. As a consequence of these epistemological efforts there are lots of Women's Studies in many general empirical fields and topics of Social Sciences in Finland. There are some dissertation works with high quality empirical settings and specially targeted goals derived from feminist epistemology. There are too many examples of what kind of gender related contents there could be outside the Social Sciences.

In Finland the Gender and Science Studies are aimed only to the academia. One reason for this is that most of the higher research is done in the public universities, where too the Gender Studies are placed and where they are almost only possible to execute. Due to the feminist approach the research areas have been narrow, first aimed at developing epistemological background and concept for the Women's Studies and second pondering the lack of women in Engineering, ICT and Technology. Other public and private research institutes and R&D activities are out of scope, telling that there has not been interests to widen the academic experiences. Also Biomedicine and Life sciences are not studied from the gender perspective and are lacking from the Finnish GSD, although these are "feminine" and female dominated practises and branches.

The emphasising of women's subjective experiences has conducted fewer quantitative research and led neglecting studies of social interactionism of gender systems. This can be seen in the conceptual separation of Women's and Men's Studies and in the lacking of studies of men's and women's interaction except for the male stream oppression. One can see maybe this problem in the narrow research fields of 2.2 Pay and funding and 2.5. Scientific excellence.

Finally if one just to be feminist and conceptual thinker, it is difficult to affect the prevailing male dominated practises of Finnish science just inside the Social Sciences. The epistemological efforts of Women's studies have not led to structural changes and the gender mainstreaming policies in the academia and among other disciplines, like in the Life Sciences. They are more results of individual interests than systematic scientific programs and approaches. More widen epistemological approaches and more targeted empirical research is needed to uncover the problems of men-women interaction in science. And if one wants the structural change, more political and more "gender mainstreamed" measures are needed and to be supported.

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Bibliographical references are not systematically quoted in the text.

4.1. Horizontal and vertical segregation

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