



Meta-analysis of gender and science research

RTD-PP-L4-2007-1



## **D31 – Country report Slovakia**

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March 2009

## 1. Introduction

### Main trends in research on gender and science from 1980 to 2007

To summarize the history of the gender in science, it was set to start with 1980, when the science was influenced by socialism. The research had been done a little bit differently, still on remarkable, outstanding level. Women were equal and the opportunities for work were tantamount – due to law, where everyone was obliged to work. The researches were done on work-life balance and child care and education of women. The trend was to use quotas to support women presence especially at technical fields. Women were supported via various organizations. Role models were existing in so-called “Stakhanovite” or “hard workers”, while this title was a praise for worker. They were praised especially around the March 8, which was the red-letter day for “International day of women” (Abbreviated as MDŽ). This was an occasion for focusing at women’s performance in all spheres of a life. The celebrations were done on formal level e.g. in factories were having special meetings, the notice boards were showing results in diagrams or photos, on informal level e.g. in families women were given snowdrops – the first spring flowers. Thus this was not only a top-down approach of having women in certain positions, but it was both i.e. the bottom-up approach meant the feeling of men and children that women are hard workers and mothers at the same time.

“All of a sudden” in 1989 was the year of system change i.e. socialism was turned into democracy. Obviously the change is still continuing. The researchers were changing their targets and a bit also the methods of work. As for the support of women “all at once” the old system or socialistic structures were redundant and considered wicked and suspicious to be “crooked”, therefore the organizations had been abolished one by one. Nevertheless from perspective of year 2008 one could state, that since then we were and still are rebuilding very similar system under “new labels”, e.g. the International day of women is not celebrated on formal level any longer (probably some rare instances), the informal level still exists mostly because of the snowdrops habit, which is crossing the mothers day – which is more democratic red-letter day in comparison to MDŽ, which is considered not to be democratic due to its celebrations during socialism. The difference is that MDŽ was celebrating all the work of women, while mother day is celebrating only “motherhood”.

In 1993 Slovakia has separated from Czech Republic, thus the capacity of science lowered, divided between two states. Because of the common history and coexistence with Czech Republic it is recommended to read also report of Czechia for the mutual researches could be explained better in that report. A significant trend was launching of Helsinki group in 1994 and its actions. The year 2004 was significant for accessing European Union, researchers are using EU funding and adjusting to new trends.

Main trend was noticed in getting young people, pupils of primary and secondary schools involved into the science. It was obvious from literature and praxis as well – as the theory reacts on the needs of praxis. There was a shortage of good scientists and practical technical, biochemical, agricultural, industrial leading workers noticed, for instance: in the book titled “Where is Slovak science and technique heading to” published by Academia Istropolitana Bratislava or in the activities done for children such as Summer University organized in western part of Slovakia (Bratislava) and eastern part of Slovakia (Košice) as well as “Confectionary” for young scientists and “Scientists night” etc. All of them are a good practice for what was being done with youngsters. This work was primarily “pre-reserved” for mothers, women, who “ought to be (supposed to be) scientists”. But those activities were coordinated by men as the reward (financial or credit, praise) was reasonable. Nevertheless these activities could bring together the interest of male and female and create a positive atmosphere of willing “good for our children”.

## 2. Analysis by topics

### 2.1 Horizontal segregation

Main research questions: Expectations and reality of career were aim of some studies also the needs during their career from early stages to mid- and late stages of career.

- Those expectations and reality comparisons were to reveal the gender barrier in science, consequently also to show the leaky pipeline.
- Question of decision-making during the school was often and is becoming even more frequent. Apart from repeated question of leaky pipeline, there is a question of secondary school pupils and their decision-making about future career, especially whether they would or would not like to be a scientist. This was already mentioned in the introduction.
- Statistical overviews of the horizontal segregation are brief.

The research approaches applied were qualitative analysis - interviews, questionnaires, quantitative analysis - secondary data analysis of available information such as on personal policies and management structures i.e. the number of women in top management positions or positions in advisory boards etc.

Main findings: All segregation was found to be pretty much under the power politics, where exists differential treatment towards the abilities and skills of men and women. The theoretical assumptions of the gender studies were based on following:

- “male hegemony and prejudice of neutrality and objectiveness, male solidarity” all these notions are to describe the representation of male scientists and scholars at academic hierarchy in terms of expectations and reality i.e. expectation is neutrality and objectiveness and the reality is hegemony, prejudice and male solidarity that is guarding the natural situation, where women have to accept that they will suffer the carrier loss of two years per born child,
- the domination of the area, all over entrenching of system by male (for instance no women was participating in the programme of EURATOM)
- The feminization and masculinization of individual sectors of economic activity has deepened. The third most feminized group of occupations were scientific ones.

The segregation is starting in early age, when children i.e. pupils at secondary schools see the behaviour of their parents and are starting to think about their own future occupations. Girls and boys are coping their parents and already a girl understands that the technical field of study is not a girls issue, girls rather see their role model in “super model” or “TV presenter” (not decision-making positions) and boy sees the role model of being a “boss or manager” (higher rank positions). Thus the shocking, but truthful fact was that prevailing number of pupils are not interested to be a scientist because of low salary, huge pay gap not between male and female but between other professions. There is a recent increase of having ones own business, where you are owner, boss and worker at the same time, “probably this means equality in pupils world”.

Main gaps: The missing part the issue are the opinions of underestimating third party in an average extent. It is missing: the observation of the mutual reactions of the tripartite (top-down approach of a change) and mutual reactions of the informal groups (bottom-up approach of the change). Obviously the solution has to be done from the informal groups with help of the policy makers. This was not described in any published and searched item. Several gaps are persisting.

## 2.2 Vertical segregation

Main research questions: Vertical segregation could be described in one of the questions: how do the scientists estimate the representation of men and women in science from gender point of view. Among other research questions were:

- Existence of the glass ceiling was surveyed carefully and this makes the researcher to combine the research of vertical segregation and horizontal one. To compare the existence of glass ceiling with other fields.
- Gender determined barriers in science such as: stereotyping, role playing and repeating.
- Statistical overviews of vertical segregation are abundant.

Most of the questions were devoted for the statistics and then the reasons behind the unfavourable situation.

The research approaches: Quantitative approaches, statistics overviews and usual indicators for vertical segregation had been researched. Qualitative approaches were used for obtaining details of glass ceiling, stereotyping and management practice in favour of men.

Main findings: “Scissors diagrams” were the most frequent findings (done for the university students and academia overall) proving the rightfulness of searching the topic of gender in science. Statistical overview of presence at boards and steering committees were representing the problem of horizontal segregation. The similar reasons for horizontal and vertical segregation were pointed out. Women were not given responsibility at boards and not given the pay for it as well. The reason for low presence of women in some committees (rather technical fields) was personal policies which actually were not reflecting the culture. The horizontal and vertical segregation were described as a natural and scientific fact stemming from the socio-cultural identity. Also other reasons were: the system of personal policy and the system of management of human resources.

As a new notion tends to be “bubble of the glass ceiling” – the women in top positions were claiming that the glass ceiling is a bubble i.e. that it does not exist at all. The findings were concerned with the glass ceiling and usually the vertical segregation is being described with together with the horizontal one.

The solution for the glass ceiling was suggested to “allow” once in the 3 years that the lecturer would be free from lecturing and working with students the pedagogical processes. The workload would consist of writing monographs and doing a proper research. This way women can have chance to change the glass ceiling perception.

Main gaps: There is a lack of articles on detailed situation. It is still challenging to find the necessary data organized by gender, over longer periods of time, and in specialized statistics publications. Notably lacking are regular and comprehensive publications of gender and age indicators. Nonetheless there is a scissor diagrams and glass ceiling description, which could be expected in other fields and organizations.

## 2.3 Pay and funding

Main research questions: The questions are not very rich in the gender pay gap course of study. There are only two similar questions:

- Is the gender pay gap widening?
- Another similar question was comparing the situation of two eras “socialistic” and “democratic” one.

The research approaches: Some questions were possible to be answered with help of the statistical methods. Descriptions and comparisons, analysis and synthesis were used as methods. The figures of honeypot score and educational differences were accompanying the charts and descriptions.

**Main findings:** The analysis of the needs, goals and resources was the undividable part of the inputs and outputs for the planning and optimalization of the society's life and also the life of individual. The work of good quality ought to be appraised by transparent and responsible system. The management of the individual career is joint with the honesty and intelligence and energy integrate in each human being. Afore mentioned sentences could be rephrased as "during socialism there was no freedom and some money, during democracy there is a freedom and merely no money".

Statistics were proving that the gender pay gap was widening in the researched period significantly.

**Main gaps:** The gender pay gap is a bit neglected topic as it is rarely connected as a cause of the segregation. There exists a simple reason for this occurrence which is science as a part of economy is meagrely financed.

## 2.4 Stereotypes and identity

**Main research questions:** The main questions could be summed up as follows: historical development of stereotypical behaviour, examples of non-stereotyping e.g. married women with children can do science; reflections of gender asymmetry in specific institution had been examined by interviews.

The questions could be further summed in the following areas:

- Analysing the gender dynamics in research teams including the language, culture and iconographical presentation of science.
- Finding solutions on how can women cope with stereotypes during career or at early stages, deciding about their professional field.
- Historical precedence of non-stereotyping, proving the hypothesis - "formula of the woman, who can possibly work effectively in the science was studied in compliance with stereotypes i.e. woman may have children and can be married and still having a career in science".
- Studying the forms of discrimination as a part of stereotyping, neutral versus masculine versus feminine.
- Gender culture, real life application what are they.

**The research approaches:** Qualitative methods were used usually the interviews. Other methods such as: statistics, comparison of the results, examples, good practices – analysis and following synthesis of the results. The findings were published especially thanks to compilation of statistics and in depth interviews. Nevertheless also triangulation as an epistemological tool can set, estimate the true picture of the merit.

**Main findings:** Traditional minded researchers would defend the opinion that male style of research has got long history. One can begin to notice that women can do both science and child care providing the fact that they can use good conditions. The reflections were proving similar findings of somewhat different "feelings" about gender asymmetry. As persons from inside i.e. women working in this environment and persons from outside i.e. men and women working outside of scientific fields (journalists, politicians) see the situation differently. Thus descriptions, judgments and results of such studies are ambiguous. As for the women's first choice – Slovakia does not feel that there is a problem that women are not choosing the engineering professions. There were found some articles on this issue.

The education (distance, bachelor and master study programmes) has to be accessible without social or other forms of discrimination. The other discovered forms were somewhat hidden forms of discrimination – a latent and invisible discrimination.

The Helsinki group is being offered as a help for overcoming the obstacles derived from various stereotypes.

Main gaps: The papers, articles were not deeply searching the human capital theory or role models behind it. The human capital theory seems to be a gap in the gender studies in respect to low degree of women interaction, networking and thus breaking the stereotypes and rebuilding their identity – “good will” in science. The articles showed the stereotypes in line with culture typical for Slovakia. Thus the identity of science is respected to some extent or the research is very cautious and so are the articles as outcomes of such researches.

## 2.5 Science as a labour activity

Main research questions: Main research focus was turned for:

- Discrimination during career in academia was included into the research focus.
- How to help woman overcome the problem of “loss” due to maternity leave.

The research approaches: Comparing statistical data, illustrating the impact and consequences by qualitative studies.

Main findings: Summarizing the findings to above named questions:

- Women experiencing gender discrimination for instance a critical study of statistics proving the facts about the labour activity of universities.
- The crucial finding is “the goals of women are more structured in the time line (scale) comparing with men counterparts”. Women are more organized; they gained skills during the maternity leave e.g. the organization skills. The potential of women is not fully utilized, women are underestimated.
- Polarization of career of life, expectations, motivation with inevitable decision between the solicitude of family or career

Main gaps: Gaps in this research are persisting. Missing are comparisons among universities, universities and the researchers are not willing to provide rather unfavourable data. Criticisms are not popular, which may be the reason for fewer studies in this field.

## 2.6 Scientific excellence

Main research questions: The research was aimed on how to accelerate women’s career in science.

- Communication technologies as a tool analyzed for the help in women career.
- Identification of good practices.
- What are the cultural behavioural differences at work? Is there any model of cooperation? Who does the mentoring?
- Analysis of possibilities of other education that can be used to help the scientific excellence.

The research approaches: Analysis, description of successful women biographies, good practice observation.

Main findings: Findings were rather covering the male behaviour – having time for sport and other activities for socialising and expending their human capital. Other possibility was that the women are on maternity leave and they should not talk only about nappies with their female friends. Communication technologies combined with teleworking was found and recommended as a tool to help women keep the pace with male counterparts, although it is only a part of “partner model of cooperation.” Mentoring could be again a part of the helping hand for acceleration of women career.

Biographies of the well-know women in science were the main outcome of this research surveys. Distance education was also popular for researching for some years around 2003. This

researches and projects are continuing and have their positive results depending on the accessibility and financial feasibility.

Main gaps: There were identified plenty of gaps in this topic e.g. there was not any research on peer evaluation. The productivity measurements are becoming popular mainly for universities and institutions as a whole for the financing depends on the productivity. The number and the quality of the papers become to be important for the management of the university and the research work as well, but the research papers on that topic are still missing – there is no special focus on women productivity, though.

## 2.7 Gender in research contents

Main research questions: Topics for research questions were the following:

- Philosophical (some epistemological questions) opinions on male domination in science.
- Analysing the gender asymmetry.
- Politicians and scientists have different standpoints also teachers and academia representatives. Their opinions were analysed and compared.
- The media representatives are observing the issue and may have two folded function: first to merely describe the ongoing process and/or second to influence the process by their comments. Which one is prevailing?

The research approaches: The interviews and expert panels, meeting were used to study the opinions in academia representatives and media representatives. Gender in science was studied from point of view of politicians, scientists, teachers or academia representatives and media representatives.

Main findings:

- If we admitted women in the science, then we admitted also consent of household work division this was labelled as “partner model of cooperation.” This leads to consequence that the male domination in science is not sustainable in all the fields.
- The cultural difference exists – male domination returns in the behaviour. The tolerance of women in the science is not popular, although there are equal opportunities the hindrances exist in culture e.g. family services etc. The gender asymmetry exists in the hidden “space” i.e. it is difficult to prove it empirically, nevertheless it is “visible” in the contents (e.g. the number of women authors publishing in the magazines of technology, engineering, physics, chemistry.)
- The three standpoints - the findings were diverse i.e.: First: politicians think that there is no problem that the science is gender neutral in general. Second: while scientist prove patriarchal model of science. Third: media use gender insensitive language as was reported by skimmed literature.
- Hypothesis of two folded function was that both of them are functioning and the prevalence is oscillating over the time.

Main gaps: Epistemological questions are not discussed very much. Only sound researchers, who work several years with the issues, are getting deeper into the issues, i.e. they do not look only for statistics but also for interviews and quantitative explanations, which could reveal the gender ness of science.

## 2.8 Policies towards gender equality in research

Main research questions: Leaky pipeline solutions controversial statistics and activity of policy-makers those were the issues tackled by this area of research. In line with stereotyping what measures could be done in work-life balance – this was favourite topic for policy makers. Also

an “attrition effect” seemed to begin to be interesting for policies. Further questions that the researchers were trying to shed a light on were following.

- Thanks to cooperation with other countries there are comparison studies, where Slovak examples are illustrating the stereotypes and identity of science. More cooperation brought together also other counterparts from various institutions (NGO’s, labour unions, ministries and academia). This could be of advantage for politics and further measures to be developed.
- Researchers were studying strategies of universities, whether they have an evidence of women oriented help.
- How to bring more interest for policy towards gender equality in research? Cooperation of various counterparts is to help the implementation of policies?

The research approaches: Observation and discussions, implementation of policies.

Main findings: Policies were suggested to apply some of the women supporting principles: feminine principle. Nobody would like to have women by quotas in the science as it is a cultural feature in Slovakia stemming from era of socialism. Policies claim rarely any problem of science identity, it is neutral. Thus the interest for more policy creation towards gender equality was summoned by the cooperation with other countries for the sake of comparison studies, where Slovak examples were illustrating the stereotypes and identity of science. More cooperation brought together also other counterparts from various institutions (NGO’s, labour unions, ministries and academia). This could be of advantage for politics and further measures to be developed. The gender mainstreaming exists.

Specifically, some private companies are offering benefits of nursery schools or others the universities are not showing any proof of positive discrimination of children for they have two parents! The women are the one, who take care of child during the first years, but it continues to be so because of probably another baby is born or just as a matter of routine and cushiness of male, who can use many excuses. Again this signifies the overlap of hidden discrimination whether positive or negative one. Here some countries have the opportunity of paternity leave, which in Slovakia is not popular.

The activities for women in research exist, but these are not covered under unified association. And their impacts are missing a desired response.

Main gaps: The gaps are in naming the causes of negatives in the scientific research, overcoming the problem of criticism and allowing the effects of discrimination to be solved in the legislation or the mentoring support or in other ways. There is lack of general publication about the prizes for excellent researchers. Probably the gaps are prevailing, because of the thinking that breaking stereotypes of working in certain fields means creating imbalance elsewhere i.e. in family. As usually and long vivid tradition of family life is mother is the grindstone of it.

### 3. Conclusion

Main findings: The main findings of the informed bibliography on gender and science were not rich on unique issues or outcomes.

Diversity of Europe with all its nationalities is the best example how to support the diversity in science. It is only natural that the situation as it is now (i.e. low number of women in science) would not change in say ten years. But the scientists of today are aware of the forthcoming trends of plenty of changes in the sense of their disciples.

Many times the authors of studied literature had included an encouragement for positive change for all women in science. Thus there is a will and one could predict there will be a way of achieving that positive change. The recommendations were involving the steps of how to enforce talent and knowledge of women working in science.

For the particular topics summarized findings were following.

As for the horizontal segregation – male hegemony was presented among the main findings.

As for the vertical segregation – “bubble of the glass ceiling” had been introduced as the finding in the study of women, who achieved top managerial positions in the science.

As for the gender pay gap – the research is not very rich.

Concerning the stereotypes and identity – the usual research questions were bringing expected outcomes as the latent discrimination.

Concerning the science as a labour activity – the uncovering of the typical “women goals` time line” was important.

Concerning the scientific excellence – “partner model of cooperation” as well as mentoring together with policies could help to accelerate women`s career.

In relation to gender in research contents – media function was seen as the one to connect the standpoints of academia representatives and politicians.

In relation to policies towards gender equality in research – the activities are scattered and their effects are difficult to be measured and regulated.

Main gaps: There are a few researchers working in the area of gender studies, some do this research as a supplementary research. There was no new gender indicator established in Slovakia.

Missing were: statistical publications, mutual studies of reaction of the informal groups – the bottom-up approaches, gender pay gap statistics and descriptions, human capital theory is not included in the researches, university comparisons, peer evaluation, productivity measurements, epistemological questions and their explanations, legislation and mentoring monitoring actions.

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