

Cooling Out? Gender and Research in Switzerland

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In Switzerland, too, the numbers paint a clear picture: While the gender ratio is practically even amongst those beginning tertiary study¹ the proportion of women falls consistently from graduates to doctoral students, post-docs and habilitation candidates, right up to professorships. The proportion of women professors in Swiss universities makes up barely fourteen percent of the whole in 2006. Indications are that this proportion is increasing steadily, although slowly. This effect, which can be quantified by analysing gender ratios across particular groups, is what we neutrally call a 'loss rate', resulting from gender-specific elimination or exit points that exist at all levels of the academic career ladder. As the numbers show, this loss rate is greater for women than for men and increases the higher up the ladder one goes. The consequence is the well-known truncation effect, metaphorically known as the 'leaky pipeline'.² The gender-based selection processes leading to such truncation seem to vary according to discipline and status, as well as in scale.

The Swiss National Science Foundation (SNSF), the most important institution for the support of research in Switzerland, wishes to evaluate this phenomenon in more depth, but repeatedly finds itself confronted with the same problem. Thirty-three percent of all early-career research applications received by the SNSF for fellowships in 2006 were submitted by women, while 32 percent of the applications in the advanced researcher category and only 26 percent of the applications for funded SNSF-professorships came from women. In proposals for the project funding category, aimed at researchers who are already established, the applications by women made up only 19 percent.³ In the last category, involving proposals submitted to 'project funding', a pilot study carried out by the

1 At least on average, though with significant deviations according to discipline in favour of more men or more women.

2 See the brochure: "Chancengleichheit von Frau und Mann und Gender Studies" by the Swiss Federal State Secretary, 2007. (http://www.sbf.admin.ch/htm/dokumentation/publikationen_de.html) (in German and French)

3 All experienced researchers at Swiss universities or Swiss research institutions may submit applications for the project funding category. A professorship is not required.

SNSF in 2004 in three selected disciplines (psychology, law and chemistry) showed that the number of applications did not correspond to the actual pool of possible applicants.⁴ Comparable indices exist in other countries, where indications suggest fewer applications are being submitted by women than by men.

Objectives of the Study

The SNSF has thus commissioned a study, which is being carried out by a research collective consisting of the Pedagogical University of Zurich (PHZH), the Centre for Labour and Social Policy Studies BASS (BASS) and the Federal office of Statistics (BFS). The study, undertaken by the team of Regula Julia Lee-mann (PHZH), Heidi Stutz (BASS) and Katrin Schönfisch (BSF), began in October 2006 and will continue until the end of June 2008. It has two main objectives:

Quantification of gender-specific loss rates (descriptive aspect): Gender-specific loss rates are to be quantified by disciplinary field and for the Swiss academic system as a whole. In this way, the emigration and immigration of academics into and from other countries can be taken into account. Further, the career trajectories of next-generation academics are to be described, especially with regard to the follow-on effects or receiving individual and/or project funding from the SNSF.

Analysis of the reasons for gender-specific loss rates (explanatory aspect): The aim is to investigate the reasons, both internal and external to research institutions, for the rates of loss. Here the particular interest lies in the role played by the SNSF.

The target groups under investigation are next-generation researchers across all qualification levels (doctoral, post-doc, habilitation). Those academics who have left research careers are also included. There are two reasons for concentrating on next-generation researchers: On the one hand, the disadvantages and difficulties for women occur above all in the pre-professorship phases of the career path. On the other hand, these early-career trajectories can be investigated using various methodological approaches, thereby illuminating different aspects of the biographies and leading to a more complete picture.

⁴ The pilot study was done by Yvonne Jänchen and Kristina Schulz, University of Geneva, for the summary see: http://www.snf.ch/SiteCollectionDocuments/wom_ber_GEFO.pdf (in German)

Factors Involved in the Loss Rates

In analysing the reasons for the exclusion and/or elimination of women from the academic career path, we must differentiate between factors that are external to research institutions (such as age, family situation and care responsibilities, personal motivations or social background) and factors that are internal to research institutions (such as a male-dominated research culture, disciplinary support through mentoring, ties to informal and formal networks within the scientific community, or integration in universities). Research-internal factors also include access to and support by measures and policies for research advancement, including those aimed at next-generation academics. Greater accessibility is achieved through the intentional directives of research advancement policies and equal opportunity politics than through the support and integration offered by individual university lecturers, or by the institutions and the scientific community. These multiple factors have not only a direct but also an indirect influence on careers, as they mediate the achievements required for a successful academic career (e.g., funding proposals, networking, job applications, publications, mobility, motivation).

Gender-specific loss rates are also characterised by an oscillation between self-exclusion (withdrawal) and social exclusion, though it is often not possible to determine each element precisely or to separate them out from one another. What interests us in the present study is how the research funding and next-generation support provided by the SNSF in particular, but also by the government and other institutions, influences successful career advancement in relation to research-internal and research-external factors.

In Switzerland, unlike other countries, there are few alternatives to the SNSF when it comes to seeking support for one's research. The SNSF is the largest funding body in Switzerland for all disciplines. It remains an independent foundation, even though it is financed exclusively by federal funds. Its total budget in 2006 was approximately 300 million Euros (491 million CHF). The largest portion, 64 percent, went to the support of projects in the category of 'project funding' (which indicates a free choice of research topics); 19 percent went to the support of individuals (fellowships, funded SNSF-professorships, etc.), while 13 percent went to targeted research. For the purposes of tracking project funding, the SNSF divides the range of disciplines into three categories: humanities and social sciences, natural sciences and engineering, and biology and medicine.

The proportion of applications from women is particularly small in the project funding category. In 2006 the humanities and social sciences received 28 percent of their applications from women, the natural sciences and engineering

9.5 percent, and biology and medicine 22 percent, resulting in a total application ratio of 19.5 percent of all submissions being made by women. The reasons for the low number of proposals are unclear and demand a more full investigation. The SNSF is particularly concerned with uncovering the reasons for this low rate of participation and learning whether and to what extent the SNSF's own funding policies contribute to the loss rates, in order to optimise the effects of its gender equality measures.

Research Design

The commissioned study 'Gender and Research Support' (GEFO) aims to investigate the scope of and reasons for the gender-specific loss rates. To achieve this, it has set itself five foundational tasks, each arising from a different perspective, in a combination of quantitative and qualitative methodologies. The target groups, as mentioned earlier, are the next-generation researchers (doctoral candidates, post-docs and habilitation candidates). The timeframe for the investigation spans from 2002 to 2007, which includes a historical aspect to the gender-specific loss rates.

Module 1: Evaluations from the Swiss University Information System (SHIS)

Using statistical data gathered over the course of the last decades by the Swiss universities belonging to this system, the analysis processes individual-based data calculating the gender-specific loss rates in the doctoral and habilitation phases as well as the average length of time for PhD and habilitation completion, respectively.

Module 2: Supplementary Module and Evaluations of the University Graduates Survey of 2002 (Panel 2003/2007)

University graduates from 2002 (first degree as well as PhD) were surveyed for the second time in early 2007 about their projected career paths, in the form of the Swiss University Graduates Survey conducted by the Federal Office for Statistics (BFS). The GEFO project inserted a supplementary element into the existing questionnaire on the theme of research or academic trajectories (e.g., gaining qualifications, research activity, scientific networks, academic integration and support by individuals and programs, publications, etc.). The next-generation

academics were asked in particular about applications they had submitted to the SNSF and other institutions, and how successful these applications had been. The analysis of this data will support conclusions to be drawn about questions of access to research support and its effects on career trajectories.

Module 3: Analysis of the System for Application Administration at the SNSF

A quantitative analysis of the system for application administration at the SNSF makes it possible to prepare gender-specific personal and proposal profiles from the first application to the SNSF for project support (as either a main or co-applicant) and from applications for a funded SNSF-professorship by next-generation academics. The team aims to trace the effects of various factors such as gender, age, disciplinary field, linguistic region or previous contact with the SNSF (such as applications for individual funding, collaboration on an SNSF funded project) and calculate their influence on the success of an application and the amount of funding received.

Module 4: Content Analysis of Selected Application Dossiers

Approximately 40 randomly selected dossiers from four disciplines (medicine, physics, linguistics and law), consisting of 20 applications by women and 20 by men (150 dossiers in total), are to be systematically evaluated in order to determine further gender-specific differences amongst personal profiles.

Module 5: In-depth Interviews

The aim of these in-depth exploratory interviews with next-generation academics from across the disciplines is to evaluate their subjective experiences, motivations and reasons for undertaking the academic career path. The interviewees come on the one hand from the sample provided by the University Graduates Survey, where those surveyed had an opportunity to indicate their willingness to take part in an interview (Module 2), and on the other hand from the system for administrating applications at the SNSF (Module 3 and 4). The interviews will seek to clarify the following questions:

- § How have particular research-internal and research-external factors made it harder or easier to pursue an academic career path after completing the doctorate?
- § What difficulties and avenues of support have the interviewees experienced?
- § What insecurities and doubts have they had to overcome or are still in the process of overcoming?
- § What career alternatives do they see before them?
- § Which, if any, applications have they made for either personal or project support at the SNSF or other institutions?
- § What has their experience been with these applications? This question seeks to elicit the factors that have led to a successful application record as well as those leading to an unsuccessful record.

Initial Results

Module 3: Evaluations of the System for Application Administration (GA) at the SNSF

A statistical evaluation has sought to answer the following questions:

- § What differences exist between the application records of women and men amongst those who first applied to the SNSF for project funding between 2002 and 2006 as either main or co-applicants, and amongst those who applied in this period for a funded SNSF-professorship?
- § Do women and men with comparable personal and academic profiles appear equally active in their applications?
- § Do women and men with comparable personal and academic profiles have equal funding and career opportunities?

The fundamental data for this part of the study comes from the system for application administration (GA) at the SNSF. To delimit the field of next-generation academics, information was taken from the GA database about everyone who submitted their first SNSF application for project support, as either a main or co-applicant, between 2002 and 2006, as well as those who applied for a funded SNSF-professorship for the first time in the same period. In this case, it did not matter whether the applications were successful or not. Those individuals who were already 45 or older in 2002 were excluded. All applications submitted by individuals in this period were included, such as projects in which they had ap-

peared as co-applicants as well as all fellowship applications. One difficulty that arose was that the GA did not have access to information about all the variables relevant to the investigation, such as the applicant's subject of study at university or present position. The results thus hold for only those variables about which information was readily available. In addition to the descriptive evaluations, the team used regression analysis to isolate gender-specific differences in relation to various indicators of success, simultaneously controlled against other influences. A range of independent variables come into consideration as explanatory factors: gender, age, nationality, linguistic region, disciplinary subject, etc.

The most important results for the total sample of 2413 people, 24 percent of whom were women, are as follows:

- § When women submit an application they do not request any less money for their projects than men (controlled against other influential factors under consideration). This holds for both the total sum per person and the average sum requested per application.
- § When women are successful in their applications, they do not receive any less research money for their projects. This holds for both the total sum per person and the average sum approved per application.
- § Women who submit applications to the SNSF do so no less frequently and on average are no less successful than men.

The applications for funded SNSF-professorships (560 applicants in total, of whom 26 percent were women) show results similar to those of the entire sample. When women submit an application to the SNSF for a SNSF-professorship, they do not differ from their male colleagues in the conditions of their application (total sums requested, average of requested sums) or in their chance of success (sums received, average of sums received).

Module 4: Content Analysis of Application Dossiers to the SNSF

The aim of analysing the application dossiers submitted to the SNSF is to strengthen the quantitative evaluation capacity of the system for application administration. This requires, of course, observing strict data-protection procedures. In particular the analysis of curricula vitae and publications lists makes it possible to gain important new insights about the educational trajectory, career trajectory, international mobility and symbolic and social capital of the applicants. The following questions are addressed by the analysis:

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- § To what extent can the curricula vitae and publications lists in the application dossiers be differentiated by gender?
 - § Do women and men with comparable personal and academic profiles appear equally active in their applications?

The investigation makes no attempt to distinguish amongst the applications based on the academic quality of proposals. It is thus not an attempt to compare degrees of excellence, but rather to compare the academic careers of men and women in the same disciplinary subjects according to particular variables. The data pool draws on a random sample of approx. 20 women and 20 men from disciplines that have been largely under-investigated, namely human medicine, law, linguistics and literatures, as well as physics. In total, 150 dossiers were selected and evaluated.

The methodology applied was quantitative case analysis. The first step involved descriptive evaluations of each disciplinary field. This suggested some gender-specific differences, but these could not be counted as statistically significant because of the small size of the pool. In a second step, a Cox Regression over all disciplines was calculated as a more comprehensive form of analysis. Two concrete questions can be approached with this method:

- § What affects the length of time between PhD completion and the first application for funding? Do men submit proposals more quickly than women?
- § What affects the length of time between PhD completion and the first successful application for funding? Do men submit a successful proposal more quickly than women?

The results of the optimised Cox model for Question A show no gender specific differences, but a clear effect of children for women as well as for men. Ten years after the dissertation 84 percent of the researchers without children but only 56 percent of the parents have submitted their first funding application to the SNSF.

The results of the optimised Cox model for Question B show that, of all the explanatory variables available, gender has no significant influence. Again, however, for people with children the chances of their submitting a successful funding application in any given year is lower than for people without children. Whereas fifteen years after their dissertation 80 percent of researchers without children had at least one successful application the same applied to only 62 percent of those with children; the proportion of unsuccessful parents remains higher.

These initial results concern only two of the five modules. The final results of the study will be available at the end of 2008 on the website of the Swiss National Science Foundation (www.snf.ch). The findings will then be published in book form in 2009.