# In Search of the Glass Ceiling: What Mechanisms and Barriers Hinder Qualified Women from Progressing in Academia?

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#### 1 Introduction

Despite women's achievements in higher education – more than 50% of university graduates in Germany are female – the proportion of women in top positions in science is still relatively low and 'gets more pronounced on the higher rungs of the academic career ladder' (Gottschall 2010: 256). Although the number of women who are appointed to a professorship has been increasing since 1990, the proportion of female professors was only 19% in 2010 (Statistisches Bundesamt 2012: 26) and the proportion of women in C4/W3 professorships (15%) is still lower (ibid).

Another aspect which should not be overlooked is the differences between the academic disciplines. Whereas languages and cultural studies have a relatively high proportion of female professors (33%), the proportion of female professors in the natural sciences is 13% and in engineering only 9% (ibid: 27). This shows that the science sector is vertically and horizontally segregated: men and women work in different disciplines and in different hierarchical positions (Lind 2004: 9).

Today, the under-representation of women in top positions in the science sector has become a major political issue and there is a large body of research focusing on gendered socialisation processes, the educational system and the problems of reconciling work and family life (for a summary see Lind 2004). However, a sociological perspective should also take into account the science sector itself (Krais/Beaufaÿs 2005: 30f.).

Therefore, this article interrogates those mechanisms and barriers within the organisations of science itself which produce and reproduce gender inequalities.

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First of all, the role of sex as a fundamental code in interactions will be explained. This part includes gender stereotyping, gender status beliefs, the correlation between the image of the ideal scientist and the male gender stereotype as well as statistical discrimination. Secondly, the concept of tokenism by Rosabeth Moss Kanter will be discussed and the under-representation of women in networks of professional contacts will be explained. Finally, the concept of gendered organisations as conceptualised by Joan Acker will be introduced and the increasing importance of international mobility will be discussed as both a means of distinction and an organisational image of success.

#### 2 Sex as a fundamental code in interactions

## 2.1 Categorisations

When in each other's presence, individuals make characterisations of the other individuals around them. This characterisation is organised around two fundamental forms of identification: (1) the categorical kind, by which the other is placed in one or several social categories and (2) the individual kind whereby the other is assigned a unique identity according to, for example, appearance, voice or name (Goffman 1983: 3). Although there are several social categories such as age, race and class, 'sex is at the base of a fundamental code in accordance with which social interactions and social structures are built up' (Goffman 1977: 301). The aim of this categorisation is to anticipate the behaviour of other individuals.

Even though in the workplace the relevant social categories are already defined (e.g. professor vs junior researcher), sex constitutes a background identity throughout interaction and therefore functions as an invisible hand that stabilises and reproduces inequalities in the workplace (Ridgeway 2001: 251). A prerequisite for the powerful impact of sex categorisation is the existence of 'ideas about how people who have been categorized as male or female, generally act' (ibid: 255). These ideas can be found in gender stereotypes.

# 2.2 Gender stereotypes and gender status beliefs

By simplifying complex situations and information, stereotypes influence not only our behaviour but also our perception of the world and the individuals around us (Pasero 2003: 112). Gender stereotypes are 'cognitive structures that

include the socially shared knowledge about the characteristics of men and women' (Eckes 1997: 17). They include expectations about character and personality traits and patterns of behaviour which are the result of cultural norms and values. The male gender stereotype can be characterised by the following attributes: independent, dominant, rational, ambitious, determined and confident (ibid: 57). The female gender stereotype, on the other hand, can be characterised by attributes such as dependent, gentle, communicative, affectionate, understanding and warm-hearted (ibid).

Gender stereotypes on the one hand arouse specific expectations and therefore influence the way in which men and women are perceived by others. Women, for example, 'tend to be perceived as aggressive whereas men exhibiting the same behavior are seen as decisive' (Foschi 1992: 181). In the science sector, women are continuously confronted with gender stereotypes which ascribe low achievements to them and which devalue their potential (Kahlert 2013: 132). On the other hand, gender stereotypes are also part of the self-perceptions of individuals. As a consequence, they have an influence over their own behaviour, which means that they conform to gender stereotypes (Pasero 2003: 112).

However, gender stereotypes alone do not necessarily result in inequality. The crucial point is, however, that they contain assumptions about a different social status for men and women. Research has shown that 'male' character traits are considered to have a higher status than 'female' character traits. This is what Ridgeway terms *gender status beliefs* (Ridgeway 2001: 255f.). Again, these gender status beliefs influence both the way individuals are perceived by others and their own self-perceptions. Studies show that 'the sex of the performer biases the evaluation of performances in achievement contexts, so that men's contributions to the task solution are judged better than women's' (Foschi 1992: 181f.). Therefore, junior and even senior female scientists often experience that their achievements are devalued by their male colleagues (Beaufaÿs/Krais 2005: 90).

# 2.3 The correlation between the image of the ideal scientist and the male gender stereotype

Attributes which are considered to be factors of success in science often connote 'male' attributes (cf. Beaufaÿs 2012: 87 and table 1). According to an analysis by Hageman-White, scientists feel that they have to present themselves as dominant, aggressive and rational (Hageman-White 1992: 248).

Male gender stereotype	Ideal scientist	Female gender stereotype
Dominant	Dominant	Subordinated/submissive
Aggressive	Aggressive	Understanding
Rational	Rational	Emotional
Independent	Independent	Dependent
Restrained	Restrained	Warm-hearted

*Table 1: The correlation between the ideal scientist and the male gender stereotype* 

Source: Rosenstiel (1992: 173), modified

According to Leeb (2004), there are two different categories of tasks in academia. On the one hand, there are the teaching and mentoring of students, which are less valued and associated with 'female' character traits. On the other hand, there are prestigious tasks such as publishing and research which are associated with the mind and therefore with 'male' character traits. As a result, women are often overloaded with teaching and mentoring, whereas their male colleagues can engage in academically valued tasks which improve their career prospects such as research and publishing (ibid: 126f.). As a consequence, women often have less publications and research on their curriculum vitae than their male competitors when it comes to evaluating their 'professionality'. However, female researchers who do engage in publishing and research are often considered to be 'aggressive, masculine and difficult' (ibid). This indicates that women in the science sector are not only confronted with role conflicts, but also with a high amount of uncertainty about their career opportunities since the judgement of academic achievements is biased in favour of 'male' attributes. As a consequence of these gender stereotypes and status beliefs, women tend to be more self-conscious and underestimate themselves and their achievements, which, in turn, can have a negative impact on their career advancement.

#### 2.4 Statistical discrimination

Although overt forms of discrimination have lessened in the past decades, subtle forms of discrimination persist (Lind 2004: 100). Gender stereotyping and the activation of gender status beliefs can result in statistical discrimination (Arrow 1973). Statistical discrimination is an economic theory used to explain group inequality: 'the basic insight is that race or gender may be a useful signal of productivity, provided that productivity is imperfectly observable and correlated

with group identity' (Norman 2003: 615). Therefore, individuals belonging to different groups may be treated differently, even if they are as equally qualified and competent, since their employers make use of group averages in order to evaluate them.

As a result of the existing gender stereotypes, women are expected to be less productive, less motivated and less interested in the advancement of their career. Moreover, they are perceived as potential mothers who are therefore less resilient and more likely to interrupt (full-time) work. As a consequence, women face disadvantages concerning their career prospects: they are less likely to be offered interesting and prestigious positions and projects as well as further education (Osterloh/Littmann-Wernli 2000: 263; Zimmer/Krimmer/Stallmann 2007: 81). Finally, women realise that they face disadvantages relating to their career prospects and invest more time in other activities.

Eventually, such discrimination can result in a 'vicious circle of statistical discrimination' (Osterloh/Littmann-Wernli 2000: 263) and become a self-fulfilling prophecy.

## 3 Female scientists as tokens and their under-representation in networks

# 3.1 Female scientists as a minority group

The theory of tokenism, introduced by Rosabeth Moss Kanter (1977), argues that women's organisational experiences cannot be explained by their personalities and socialisation but rather by their status as a minority group,<sup>2</sup> which leads to three main issues in the workplace.

First of all, their minority status leads to higher visibility – 'they are subject of conversation, questioning, gossip, and careful scrutiny' (ibid: 212) and it is not only their success but also their mistakes and their private lives that are made known to other members of the organisation. It is because of this visibility that women feel that they are forced to give an outstanding performance, since 'the token does not have to work hard to have her presence noticed, but she does have to work hard to have her achievements noticed' (ibid: 216). A study by Zimmer, Krimmer and Stallmann (2007: 166) confirmed that female professors think that they have to work harder than their male colleagues in order to get the same amount of recognition. However, although women often feel that they have to

<sup>2</sup> Therefore the theory of tokenism can also be applied to other minority groups.

excel, they also feel that they should not 'make the dominants look bad' (Kanter 1977: 217) and therefore decide to keep their success to themselves.

The second tendency is assimilation. Women who are in the position of a token are not only perceived as individuals but as representatives of their minority group and they are 'more easily stereotyped than people found in greater proportion' (ibid: 211). Therefore, they are often 'measured by two yardsticks' (ibid: 214) – how as a woman they carry out the role of a scientist, and how as a scientist they 'live up to the image of womanhood' (ibid). Since the female gender stereotype and the image of the ideal scientist include opposing attributes (rational vs emotional, aggressive vs understanding), women are likely to fail in one of the categories, but it is easier for tokens to find an identity by conforming to the pre-existing stereotypes.

The third phenomenon is the polarisation and exaggeration of differences. Whereas members of homogenous groups are likely to remain unaware of their common culture, the presence of a minority group increases the self-consciousness of the majority group. Its members become aware of the commonalities they have as well as of their differences from the tokens. In order to underline their affiliation with the dominant group, they tend to emphasise their differences from the minority group by stressing their commonalities and thereby keep the tokens somewhat outside (ibid: 210f.). A way of drawing the distinction between 'male' and 'female' is to organise 'masculine' activities such as watching football together. Although it is not forbidden for female researchers to participate in these activities, they are not very likely to include them either. However, since it is often in these informal contexts that important information is exchanged and scientific ties are deepened, these practices result in a disadvantage for women.

All in all, women who are tokens are 'symbols of how-women-can-do, stand-ins for all women' (ibid: 207) and their situation generates 'a set of attitudes and behaviors that appear sex-linked [...] but can be understood better as situational responses, true of any person in a token role. Perhaps what has been called in the popular literature "fear of success in women" [...] is really the token woman's fear of visibility' (ibid: 221).

In her autobiographical report, Renate Mayntz, a German sociologist, illustrates her situation as a token by saying 'what bothered me most about my female minority status was that I remained excluded from the camaraderie of my male colleagues; sometimes I even felt like a circus horse whose feats they can be proud of' (Mayntz 1996: 235).

## 3.2 The under-representation in networks as a result of the token position

Whereas sixty years ago networks were regarded as a substitute for individual achievements, today they are considered to be an important factor for career prospects (Schneidegger/Osterloh 2004: 199). Research on gender and networks has shown the under-representation of women in (informal) networks of professional contacts, even if they occupy the same position as their male counterparts (cf. Zimmer/Krimmer/Stallmann 2007: 166), which has had a negative impact on their career advancement.

This under-representation can be explained by the historical and numerical domination of men in the important and powerful positions in the organisations of science, as well as by the mechanisms through which new members are accepted into networks. An important criterion is stereotypical self-similarity which means that the more similar a person is to another, the more positively he or she will be assessed. Therefore, women are disadvantaged because they are perceived to be 'different' (Ohlendieck 2003: 177 f.).

However, networks of professional contacts within the scientific community play a vital role in career advancement; they provide detailed internal information on vacancies in advance (Zimmer/Krimmer/Stallmann 2007: 92) and can assist in finding a mentor. In Germany in particular, the advice and help of a mentor is of great significance in the science sector (Krais/Beaufaÿs 2005: 41). Mentors not only give advice, for example on publication in international journals, but also occupy a privileged position in relation to essential resources such as jobs, research funds and professional contacts within the international scientific community (Zimmer/Krimmer/Stallmann 2007: 121). However, the relationship between mentor and mentee is also often characterised by self-similarity. Since women are under-represented in prestigious positions, it is more difficult for female researchers to find a mentor.

A study conducted by Zimmer/Krimmer/Stallmann (2007) shows that over 65.5% of female professors think that it is the informal networks that provide power, whereas only 39.4% of their male counterparts are of the same opinion (ibid: 164). This can be explained by the fact that the majority of male professors are part of these networks, whereas two out of three female professors think that women are under-represented in these networks – 42% of the interviewed females even believe that women are isolated from them (ibid: 166). As a result of their under-representation in networks, women are less integrated within the scientific community than their male colleagues. Consequently, their research is

less visible which means that they have to work harder in order to get the same amount of recognition.

# 4 Gendered organisations and international mobility as an organisational symbol of excellence

## 4.1 The production of gendered social structures within organisations

Although hierarchies and the concept of academic positions in scientific organisations such as universities seem to be gender blind (Beaufaÿs 2012: 92) and jobs are often characterized as "empty positions" waiting to be filled by the best applicants, regardless of gender' (Martin 1992: 208), organisations are not gender neutral (Acker 1977) but mirror society by paralleling the gendering practices of families and other existential groups (Martin 1992: 208). If organisational structures, processes and cultures are gendered, this means that 'advantage and disadvantage, exploitation and control, action and emotion, meaning and identity, are patterned through and in terms of a distinction between male and female' (Acker 1990: 146). According to Acker, gendered social structures within organisations are produced by at least four interacting processes.

The first process consists of the procedures and activities that are necessary in order to organise and structure the organisation, such as creating employment opportunities and conditions, rules about performance evaluation or working hours and time off (Acker 1999: 180). These activities and procedures result in organisational divisions along gender lines. The domination of men in the highest academic ranks such as C4/W3 professorships, as well as the overburdening of women with less valued tasks such as teaching and mentoring, are excellent examples of these gender divisions.

Secondly, gendered structures are produced by the creation of images and symbols that explain, convey and reinforce these gender divisions. (Acker 1999: 182). The images and ideologies of success and excellence, managers and working hours do not only influence the rules for wage setting and hiring, but also the gendered division of labour. Moreover, they are based on the ideal of a 'disembodied worker' who 'exists only for the work' (Acker 1990: 149) and does not have any other obligations, such as childcare or housework, apart from this work. However, studies show that even in academic couples, women carry the main responsibility for the children and the housework (Lind 2012: 286). According to Zimmer (2004), two-thirds of male professors say that their preschool children

are looked after by their wives or partners, whereas the same applies to only eight per cent of the female professors (Zimmer 2004: 82). These findings indicate that men can approximate the ideal of the 'disembodied worker', whereas women almost always cannot. As a result of their overload with both their private and professional obligations, they have less time than men to invest in research and further qualifications, the disadvantages of which, over time, accumulate and create another career disadvantage.

Thirdly, it is the interaction between men and women in the workplace which produces gendered social structures. Although there are some interactions in which gender is not present, there is a large body of research describing the ways in which 'gender is produced even in ordinary encounters between equals in the workplace' (Acker 1999: 184) and which shows gender differences in interruptions, turn taking or setting the topic for discussion (Acker 1990: 147).

The fourth process which produces gendered social structures in organisations is the 'internal mental work of individuals as they come to understand the organization's gendered expectations and opportunities, including the appropriate gendered behaviors and attitudes' (Acker 1999: 184). As a result of the other processes, the concepts of job requirements, career prospects and workplace behaviour that men and women have differ from each other and this, in turn, affects their careers.

All in all, the described gendered organisational structures, processes and cultures create a strong barrier for female scientists since they are biased in favour of the male majority group and create an extremely complex interrelation which affects different organisational levels.

# 4.2 The imperative of international mobility

An example of an organisational image of success that is not gender neutral but produces gendered organisational structures is the imperative of international mobility. In the past few years, international experience and mobility have become extremely important in all disciplines and are perceived as a symbol of rationality, progress and excellence. Therefore, it has become increasingly important for scientists to go abroad at some point in their career (cf. Leemann/Boes 2012: 197 f.). However, this organisational symbol is based on the ideal of the 'disembodied worker' who does not have any other obligations apart from work. Studies show that women are less likely than men to spend some

time in an English-speaking country in order to conduct their research (ibid: 198). Among other factors, such as their overload with both private and professional obligations, this lack of international experience is considered to be a result of their lack of mentoring by senior scientists who occupy prestigious positions.

All in all, the lack of international experience is a disadvantage since it results in a lack of international cultural and social capital, the possession of which can be crucial when competing for national and international recognition. Therefore, the increasing importance of international mobility cannot only be interpreted as a demand brought about by globalisation, but also as a search for new differences in times when women are equally as qualified as men (cf. Hofbauer 2004: 56).

#### 5 Conclusion

The under-representation of women in top positions in science cannot only be explained by gendered socialisation processes, the educational system or a lack of childcare facilities, but also by the organisations of science itself. This is where men and women enter employment, where they are involved in interactions and where they start and pursue their careers. Moreover, hierarchies and the concept of academic positions in scientific organisations are not always gender blind and the ideals and images of success and excellence are based on a 'disembodied worker' who exists only for the work. Therefore, the science sector and its organisations play a vital role in the (re-)production of gender inequalities. Their glass walls and ceilings that hinder qualified women from progressing in academia consist of subtle mechanisms which often seem to be invisible to the individuals themselves. In the workplace in particular, people do not necessarily realise that social interactions and social structures are built on the basis of sex or at least influenced by it. That is why the knowledge of these processes and mechanisms is of great importance in identifying starting points for establishing equal opportunities.

#### 6 Lessons to learn for women in science

Whether in science or in finance, no matter what career women pursue they have to recognise that, in the workplace, sex often constitutes a background identity that influences both the way they are perceived by others and their selfperception. With this awareness, it is possible to identify even subtle discrimination and to develop strategies to counter it.

There are a number of strategies that have been identified in the research literature, as well as at the conference on Women in Science – Promoting Excellence and Innovation for Future Development, which might help female scientists.

For students who are pursuing a career in science, it is advisable to apply for a job as a research assistant. By working in the science sector they will not only experience what working in this sector is like but they will also come into contact with senior scientists who might eventually become their mentors and give them advice and support concerning their academic career. Moreover, certain universities offer their female students special mentoring programmes and courses on presentation skills in order to prepare them for a professional career by, for example, teaching them how to counteract the differences in turn taking or interruptions in discussions dominated by men.

For junior researchers it is important to build up a network of professional contacts within the scientific community in order to get internal information on, for instance, vacancies and projects in advance. Moreover, these networks provide the possibility for (international) collaboration and joint publications. Since the amount one publishes is considered to be an indication of success, this form of publishing should be kept in mind. Moreover, the possibility of pursuing a career at a university of applied science should not be overlooked, since the career paths at these institutions are more flexible and differ from those at universities.

Senior researchers could become mentors and share their career experiences and – if experienced – their difficulties in order to serve as role models for younger researchers.

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