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Promoting women researchers' careers. An evaluation of measures in life sciences and ICT.

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Abstract

Science, mathematics, computing, and engineering are the fields where women PhD graduates are still outnumbered by men. This is true for most of the EU-27 countries, and it is still the case in Austria. However in the last decade, the number of female PhD graduates in engineering and computing has increased at a faster pace than the number of male PhD graduates in this field (European Commission, 2013). There is eligible hope that gender equality initiatives on European as well as on national level could have positively influenced this development in higher education.

In our paper we are discussing the next career step in science and research, more precisely in industrial research, which is still considered as a male dominated area (Thaler 2010). Both vertical and horizontal segregation can be found in industrial research. Female researchers more frequently specialise in pharmaceutics, so the medical sciences account for the highest shares of female researchers in industrial research whereas engineering and technology still have the lowest share (European Commission 2013). Additionally, female researchers still face several obstacles in their careers on their way to the top, not only, but especially in engineering and technology (Thaler 2010).

Liisa Husu and Paula Koskinen argued in their paper on the question of "What does it take to get to the top?" (2010) that "women researchers' careers may benefit from equal opportunity programs and specific measures to promote women" (p. 310). In 2012 we evaluated such "specific measures" of an Austrian research funding programme to find out whether they really manage to support women's careers in technology research. We conducted interviews with 23 women researchers from life sciences and from the field of information and communication technologies (ICT) who were hoped to benefit from these measures. A biographical data sheet allowed a closer look at the

development of our interviewees' individual careers before and after the measures were applied (as well as in some cases before and after taking parental leave), and we compared the two fields of ICT and life sciences, where women researchers are working in much higher numbers than in the field of ICT. Our conclusion is that although women still have to deal with obstacles on their career path, specific measures can actually promote women in industrial research. We will present details of our evaluation study, and the framework and limits of such measures intended to promote women's careers in research. Furthermore, the results will be discussed in view of a more systemic approach to the issue of equal opportunities in research.

Background of industrial research and gender

Industrial research and development (R&D) has some basic differences in comparison to academic research as it follows other rules and logics. For instance, in academic contexts publications and patents often are discussed as the result of an individual's work (although this "myth of individual, independent academic achievement" (Bagilhole & Goode 2001, p. 165) can easily be unmasked by looking into the daily practices of academic research groups). In contrast, industrial research results are often presented as success of a team or company. Especially in companies with large R&D departments, career policies explicitly distinguish between management careers and technical or expert careers (Thaler 2010).

Data from the former EU-project "Prometea" suggest that women scientists and engineers working in industrial research are highly motivated by their work content, particularly by the understanding that their technological contributions produce significant and meaningful improvements in people's lives. In 39 interviews and 16 focus groups carried out in Europe in 2006, a high degree of freedom in industrial research was discussed as well as its potential for innovations and creativity. However, the study points at career obstacles as well: organisational and structural problems like non-transparent promotion criteria, missing or inflexible and too expensive childcare facilities, dual career issues, gender stereotypes, (ambivalent) sexism, bullying superiors, competitive colleagues, and subtle exclusions from men's networks (Thaler 2010).

Most notably it is the afore-mentioned gender stereotypes that can actively hinder women's careers in academia and industrial research as women have to deal with different/higher expectations, additionally to the standards set through respective hegemonic masculinities (Connell 1995):

> "It's really interesting because in the past I was sort of 'Why couldn't I be CEO of [the company]?', and now knowing what I know now, so after 11 years, I know I will never be CEO of [the company]. As a woman, it is completely not possible to have a woman CEO." (Quote from a female interviewee, Thaler 2010 p. 68)

The Prometea-study concludes that gender stereotypes and the cognitive concept of "hegemonic masculinity", so-called "commonly held beliefs" (Six and Eckes 1991, p. 58) spread by all genders, reinforce a process of disillusioning women while they observe the career management in their research organisations:

> "But also the women who work here consider men, not women, as future managers." (Quote from a female interviewee, Thaler 2010 p. 68)

An evaluation of measures in an Austrian funding programme

The results presented here follow from an analysis of careers of female researchers who had been working in R&D-projects funded through the FemPower Initiative Vienna by ZIT – The Technology Agency of the City of Vienna. These projects had either been awarded with additional funding through the "Women Bonus" (the companies receive 10,000 Euro if the project leaders are women) or met the criteria of the FemPower Calls, i.e. they received funding because women were project leaders and/or main executors in the project and because a core focus of the project was an issue of Gender Mainstreaming (cf. Czernohorszky et al. 2011).

The evaluation of these two measures, the "Women Bonus" and the FemPower funding, focused on the two most relevant fields: information and communication technologies (ICT) and life sciences. In total, 23 researchers were interviewed; 20 of them had been project leaders of the respective projects. From the given population comprising all projects in ICT and life sciences headed by women, the sample covered 60 % of ICT project leaders and 68.75 % of project leaders in life sciences

	PL ICT	PL life sciences
population	15	16
sample	9	11
share of sample in %	**60**	**68,75**

Table 1: Share of interviewed project leaders (PL) in the population by industrial sector.

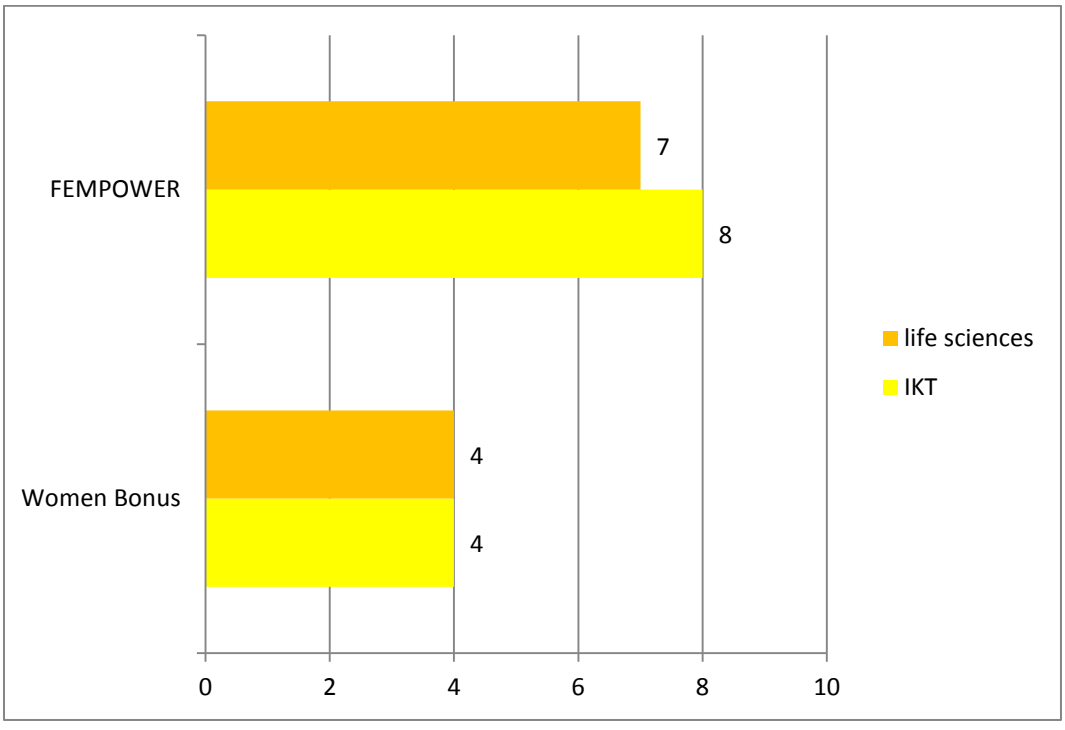

Diagramme 1: Measures for promoting women through funding by ZIT by industrial sector

The two analysed industrial sectors are particularly of interest to the funding agency as they cover the majority of project proposals answering to the calls and simultaneously represent two different trends in regard to the share of women in the respective fields of study. In the EU-27, 57 % of PhDs in

life sciences are being received by women whereas the share of women awarded PhDs in ICT is still only 19 % (cf. European Commission 2013).

The methodology applied in this study comprises guided interviews (cf. Hopf 2003) and questionnaire-like career data sheets. For quality assurance, the vast majority of interviews were conducted by two interviewers[1], and all interviews were analysed by two interpreters for triangulation (cf. Steinke 2003, Thaler & Freitag 2011). The research questions addressing the impact of the two measures of interest were:

- How have the careers of project leaders progressed after their companies received the Women Bonus for their projects?
- What impact did measures for women's advancement have on the biographies of these project leaders, in particular the Women Bonus and funding following FemPower Calls?

From 25 hours of interviews and about 100 pages of notes and career data sheets, these research questions could be answered positively:

Firstly, the measures in the funding programme of ZIT increase chances for women to assume their first project lead within the company. Secondly, the measures facilitate and accelerate women's advancement in industrial research careers. This is not only perceived by the interviewed women on an individual level but also is reflected in the career data sheets. Seven out of eight researchers took over further project leads or were promoted in another way after they got their first project lead due to one of the two funding schemes (Women Bonus or FemPower Call).

However, the measures of ZIT for women's advancement have the effect of a catalyst only for women who thereby get their first chance for managing a project. Most of the more experienced researchers among the interviewees (10 out of 12) were in higher management positions (partly even in the company management); all of them had already led a project before receiving specific funding by ZIT. Consequently, these interviewees did not perceive or mention any effects of these measures on their personal careers. On the other hand, many of these experienced researchers reported positive effects for their companies: The specific funding by ZIT allows expansions of staff and research in new fields and the pursuit of strategic objectives.

Another set of research questions target promoting and hindering factors for women's careers in industrial research:

- Which structural factors are facilitating (or hindering) women's careers in industrial research?
- How do the industrial sectors differ in regard to these factors?
- Which characteristics specific for the companies (e.g. company size) have an impact on careers?

The various results answering to these questions correspond to findings of international studies (cf. Thaler 2010). Most striking were some differences between the answers of experienced project leaders and of those who were new to this function or among project staff:

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For instance, children/being a mother is considered to be hindering to careers by some of the new project leaders – regardless if they had children – as they believe mothers to be less interested in careers, to have less time to participate in all meetings, and to be less committed to working 60 hours for their careers (which they considered a necessity for career advancement). In contrast, experienced project leaders in higher management positions stress that having children or the general issue of reconciling family live and work life is not the actual hindering factor but longer periods of absence (parental leave) and part time employment, i.e. how parenthood is practiced. An interviewee of this group refers to the discussion of reconcilability as "total nonsense" (quote from interviewee, Thaler & Hofstätter 2012), for the challenge is not having a family but creating financial incentives (based on research policies) that make company managements think about how to meet these demands.

Parental leave undoubtedly can be considered as critical phase in women's careers. Both those concerned and decision-makers report that often the task areas as well as the positions of the respective researchers may have changed at their return to the company. Quite some data sheets show career slumps after interviewees had taken parental leave. Being in contact with the company during parental leave, particularly if it lasts several months, and having a share in their work during that time may be of significance for parents. Committed companies stand out by offering corresponding options (teleworking, minor employment, possibility for communication). The hindering aspect of parental leave and part-time employment is the lack of visibility and of access to (notably informal) information. Company-organised re-entry phases, company kindergartens, child care compatible with working hours or playrooms (as short-term replacement if child care facilities briefly fail) are factors facilitating the reconcilability of career and parenthood for researchers.

Furthermore, several interviewees report to have experienced or witnessed sexism at their work place. Especially researchers from the ICT sector describe how their technological expertise was questioned in the beginning of their employment, how they had to work hard for acknowledgement, and how they had to cope with jokes and pejorative remarks, e.g. being called a "dolly-bird" (quote by an interviewee, Thaler & Hofstätter 2012) or being ignored as contact person – something that is also reported from the life sciences. Interviewees state that being the only women among the engineers in an ICT company requires tenacity and assertiveness but even then being acknowledged is not guaranteed.

Interviewees also stated that some employees (e.g. committed parents) prefer a well-balanced share between work life and private life to a career in the sense of climbing the ladder, demanding long hours. In contrast, an experienced project leader reports about experiencing the presumption of others that, as a woman, she might "prefer the second row" (quote of the interviewee, Thaler & Hofstätter 2012). This rhetoric self-exclusion probably poses a stereotype.

The ICT industry generally employs fewer women and, in this study, presents itself as a difficult field for women's careers (being the only woman, the male image, sexism, etc.). At the same time, this sector is confronted with a generally negative image as professional field, e.g. having to sit 24/7 alone programming, which is not the reality anymore. Instead there is a range of jobs in ICT that do not require an engineering degree or an academic education in the first place. In job advertisements, however, expectations and requirements are set very high which keeps women with degrees of other, related or seemingly not suitable disciplines from applying.

Many interviewees identify the “clone effect” as a reason for the glass ceiling (i.e. the phenomenon of women not getting in top positions). The clone effect – Rosabeth Kanter refers to this as “homosocial reproduction” (1977) – is the term describing e.g. men in higher positions unconsciously promoting people similar to them (i.e. they choose mostly men). This would explain the high concentration of certain types of personality in some, particularly higher positions. However, the clone effect does not only involve gender but also other characteristics decision makers consider important, like social background and/or geographical origin, age, family status, education, moral concepts, etc..

The two measures of the funding programme by ZIT targeting the promotion of women researchers are perceived positively by most of the interviewees. The measures are described to facilitate the access to project management positions which is an opportunity for women to prove their competence. The interviewees hardly mention any negative consequences of the measures, a few times the danger of women being used as alibi-project leaders is mentioned, some report about envier or negative comments by colleagues; but these instances could not neutralise the positive effects of the funding criteria. The projects funded by the FemPower initiative add to the visibility of women as the companies have to look/are looking for qualified candidates for the respective positions.

The implementation of a quota, another measure aiming at the promotion of women and increasing their share in higher positions, is more critically discussed among the interviewees: Some strong proponents think that a quota is the only way to achieve gender balance which is opposed by a few interviewees. Interestingly, opponents changed their mind during the interviews when the interviewers explained the principle of ‘relative quotas’[2] („members of the underrepresented group with the SAME qualification are to be favoured over the highest qualified person of the overrepresented group”), which leads to a certain extend of positive discrimination of women on the basis of qualification and achievement (cf. Lingg 2009).

Experienced project leaders in higher management positions frequently mention women’s promotion in the context of funding (this is also the case in an interview with a staff member without management position). Research funding and other public monies should be linked with the advancement of women and gender mainstreaming; penalties for discriminating against parents were also mentioned as probable measures. The measures in the funding programme of ZIT would be an example for financial incentives to promote women. As long as gender equality is not linked to monetary benefits it is not interesting to anybody, as an interviewee puts it. Another one states: “You can only force will.” (quote of an interviewee, Thaler & Hofstätter 2012).

Further education is another aspect raised in the interviews: An interviewee describes her idea that university courses should have certain women quotas. Some researchers also pointed out, that women should be involved in writing project proposals in order to be able to take over project management positions. Through the money of successful project acquisition acknowledgement is achieved. Especially for smaller companies funding like from the ZIT-initiated programme is a fundamental part of the budget. Some interviewees state that women need more assertiveness and that they should be supported in gaining more self-confidence and be given more responsibility –

[2] “An absolute quota prefers women until a certain percentage (e.g. a minimum of 50 %) is reached whereas a relative quota depends on the qualification of the woman who is only favoured over a male competitor if she is similarly or better qualified.“ (Lingg 2009, S. 4f., transl. B.H.)

these points being met by ZIT-funded project leads as they are connected with success and acknowledgement.

The interviews show that particularly administrative and budget-related tasks of project management are, at first, kept from new project leaders. However, financial aspects of management bear learning effects for understanding the economic complexity of the company and should not be underestimated in their importance for project leaders. As most researchers in the industrial sector have only received education in science or engineering, they often lack basic understanding for processes in business. Further education for potential or new project leaders could give them a head start, making them even more attractive for project management positions than their original technical competences.

Discussion and outlook: equal opportunities in research

Many of the results of this evaluation confirm the findings of earlier studies. For instance, the very dominating discussion on the reconcilability of family and job corresponds to what has been found in the international project Prometea. It became clear that this topic serves perfectly for broaching the issue of gender inequality whereas gender-related discrimination and sexism were only hinted at or reported in confidence (cf. Thaler 2010). Interestingly, reconcilability is only discussed along traditional family structures with father, mother and child(ren). Single mothers or fathers are hardly mentioned (rather by single parents themselves); the discussion often centres on paternity leave and the "Daddy month".[3] Same-sex parenthood or responsibilities of care for elderly and/or handicapped relatives/friends are issues excluded from this much-quoted discussion on reconcilability.

Differences in corporate cultures in regard to balanced work life and private life are not only expressed by the recurrent discussion on reconcilability of job and family. They show themselves in an unquestioned culture of late hours, constantly required availability, meetings in the evening, and frequent business trips that impede work and private life balance. According to the interviewees of this study and of the sample in Prometea, this particularly concerns parents but employees without children as well (cf. Thaler 2010).

How can women's careers in industrial research be promoted? The innovative aspect of the study at hand is that it does not end with investigating factors most likely to facilitate careers of women researchers. This study provides insight into the target group of gender equality measures through interviews with those who have already drawn benefit from the implementation of these measures. All the more, the clear vote in favour of the FemPower initiative by ZIT matters.

On a more general note, it is not particularly surprising that monetary incentives get companies to promote women researchers' careers – measures like these have often been suggested as part of (political) action plans for gender equality. This evaluation has posed a rare opportunity to actually prove this effect and shows who, under which circumstances, benefits most from these measures. However, promoting women in research careers by 'bribing' companies and research organisations into doing so is no panacea for fixing the problem as such. Also, the recurring focus on improving

[3] In Austria, public servants have the possibility to take paternal leave of up to four weeks during the first month after the birth of their child. However, currently it is unpaid and not regulated for employees in the private industry unless companies implement this voluntarily as a service to their staff (more information: http://www.maennerinkarenz.at [29.07.2014]).

reconcilability in gender equality action plans misses the point (and a lasting effect), as it is often used as a distraction from issues much deeper embedded in corporate cultures and social discourses. It therefore takes more systemic and integrated approaches that not only centre on women but on changing cultures.

In 2013, the EU-funded project GenderTime[4] was launched to address this issue. Eight research institutions across Europe, universities as well as non-university organisations, serve as case studies while they implement tailor-made action plans to improve gender equality. Starting with an inventory of existing measures, each institution designed an action plan tying in with this basis and with the identified needs for action. The innovative approach in GenderTime is the design of knowledge transfer among the participating institutions as well as within the organisations by appointing individuals in management positions as transfer agents to support the implementation of the action plans. GenderTime is an attempt of testing action plans that are targeted at all staff for the benefit of gender equality – be it by revising recruitment processes or salary-related policies, establishing transparency in decision making processes or raising awareness for issues of work culture.

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[4] For more details visit www.gendertime.org [29.07.2014]

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