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Guest Editorial
Special Issue: Gender and Masculinities in Careers and Leadership in Higher Education

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This Special Issue, recognising vertical gender segregation in higher education, combines papers focusing on challenges for women in Science, Technology, Engineering and Mathematics (STEM) disciplines in career progression and taking on leadership roles.

The literature on gender and higher education investigates the reasons for the under-representation of women in science and academic organizations. In Germany, for example, Beaufaÿs (2015) and Krais (2010) have studied women's under-representation in higher education and especially in top positions in science (Beaufaÿs, Engels & Kahlert, 2012). Hegemonic masculinity in academic culture (Connell, 1999) persists, together with a highly competitive work environment where men fight for positions in a (male) hierarchy. An important barrier for women is the expectation of total dedication to science research required in the natural sciences, which is often in conflict with caring responsibilities. Gendered constraints in scientific careers can be identified as "non-existing possibilities of flexibility in balancing professional and private lives, [where] women's poorer networking resources together with an accumulative logic of 'non-occurrences' and slight exclusionary practices … progressively disadvantage women's careers and cause a sensation of isolation, difficulty in assuming the risks inherent to the scientific career and low professional self-esteem" (EC, 2012 p.18). Women's slight disadvantages during early career stages can be exacerbated in subsequent career outcomes due to cumulative (dis)advantages (Faulkner, 2005). Morley (2013) suggests four reasons for women's absence in higher education leadership: the gendered division of labour where women are expected to take more care responsibility, gender bias and misrecognition of women's work, masculine construction of management, and university as well as family as greedy organisations.

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In Australia, White (2015) found that women, especially those with children, experience greater challenges in building their careers. These challenges often stem from their wish as early career researchers to combine their career with starting a family. Moreover, women are disadvantaged because they are unable to rely on support from mentors, often crucial in building academic careers (Krais, 2010; Gross & Jungbauer-Gans, 2007). In German STEM disciplines, men's informal networks have been found to be a powerful instrument hindering women's career progression (Sagebiel, 2010) and ability to act in leadership positions (Sagebiel, 2014).

Gender biases also exist in the production of knowledge (Rees, 2011; Sagebiel, 2015), "In particular, research which goes beyond universally applicable criteria and strict norms unmasks power relations, gate-keeping practices and informal networks as a source of tacit knowledge, support and recognition" (EC 2012, p. 18).

The invitation to submit papers for the Special Issue focused on the following six topics: new masculinities in academia; cultural changes from traditional hegemonic masculinity to new masculinities; the role of dominant men's networks in top positions; gendering of tacit knowledge; and evidence of a generational shift in how younger scientists (male as well as female) wish to do science. As a result, nine papers from international researchers, mostly qualitative studies, have been included. Five of the papers focus with qualitative interview data on excellence in academia (Metz-Göckel, Sagebiel, Salminen-Karlsson et al., White, and Wolffram), how it is gendered, and their regional variety from Germany, to Sweden and Australia. The masculine academic culture is still very dominant, with strong expectations of unilateral scientific identity, especially strong in Germany whereas in Sweden and Australia there seems to be a generational shift in expectations of a scientific life. The paper of Helena Pettersson is an ethnographic study in the US of the masculine culture of physics focussing on the experimental work and devices of scientists and explains the strength of this masculine culture. While these papers focus on gender, three other papers take a more intersectional perspective, focussing also class (Gonzales Ramos & Rätzel), region (Herman & Hilliam), age and 'having children' (Lengfeldt & Mischau).

Sigrid Metz-Göckel's paper, "The Perfect Course of Life (CV) and Double-Career Couples in Science" discusses changes in the requirements of an excellent academic career and the discrepancy between individual achievement and dependency on professional and private support. Data were taken from a larger quantitative and qualitative German study of those who leave academia. The paper focuses on interviews with six successful young female scientists in STEM disciplines at different career stages. Results show that young scientists on their way to the top are preoccupied with constructing a perfect masculine academic CV and with the demands of total personal commitment, which mirror the findings of Bozzon et al. (2017). These requirements together with less private and professional resources lead to stress at all stages of the career path and encourage more women than men to leave science. Women scientists in this German study lived linked lives, mostly in dual-career-partnerships with caring responsibilities. These dual careers, due to the societal gender hierarchy, favoured men's rather than women's careers. Successful female scientists needed to compensate for the gender gap through private support provided by various networks.

Felizitas Sagebiel's paper, "Gender and Network Awareness in/for Successful Leadership in Academic Science and Engineering", is based on a qualitative German study (2009-2012) which focussed on the potential for innovation and barriers for

women in leadership positions. It is based on semi-structured interviews and focus group discussions with female and male professors in different organizations, a technical university and different research institutes from one large governmental research organization. Research questions focused on effects of gender and network awareness on women professors' strategic responses to counter inequalities. All interviewees considered that successful leadership in a technical field required inclusion in internal and external networks, but women reported explicit and implicit exclusion from men's informal networks. Gender awareness helped in dealing with stereotypes, combatting discrimination, and practising solidarity with and support for other women. Gender aware organisational cultures were evident in mentoring programs and equal opportunity measures.

Minna Salminen-Karlsson, Andrea Wolffram and Nina Almgren's paper "Excellence, Masculinity and Work-Life Balance in Academia: Voices from Researchers in Germany and Sweden" examines the relationship between academic excellence and gender equality. The findings from these interview studies show that the perception of what excellence is, and how it can be achieved, differs between the two countries. In Germany, the concept of excellence was perceived as positive, while researchers in Sweden were more critical of it. In both countries, however, excellence in research was related to different constructions of masculinity. Most German interviewees cherished an 'all hours' culture, while most Swedish interviewees advocated a more balanced life. In both countries, respondents thought that becoming 'excellent' required both traditional academic and a new kind of business-like entrepreneurial masculinity, which impedes female researchers' career paths. The Swedish researchers, however, seemed to live in a more permissive research environment, in which different ways of being an excellent academic were possible.

Kate White's paper, "Are New Career Models for Science Research emerging?" explores how the traditional gendered model of science excellence impacts on the careers of women scientists. Using an Australian case study, it found scientists to be passionate about their research and that this commitment increases throughout their careers; and networks, mobility and mentoring are critical to building research careers and are often gendered. Moreover, gender can be a factor in career development. The most significant finding was that there is huge generational change underway in science research. The traditional masculine career model (the monastic male) has been rejected by younger men and women in science and has been replaced by more fluid models, including flexible work, that have the capacity to change science research careers.

"Excellence as a Gender-Biased Concept and Effects of the Linking of Excellence with Gender Equality" by Andrea Wolffram, emphasises the subjectivity of evaluations of excellence in promotion and hiring processes in Science and Technology disciplines in Germany. The paper uses data from interviews with researchers at different stages of their scientific careers at a German university that was successful in the German Excellence Initiative. Results show that regardless of their scientific experience, researchers perceive gender equity measures in appointment procedures as undermining the meritocratic principle. Rather, most of them think that societal conditions outside the scientific system are responsible for the underrepresentation of women in professorships and other top academic positions. Their response reflects O'Connor et al.'s (2017 p.15) study where women adopted 'characteristics associated with masculinity' and felt required to make 'constant and creative efforts to "blend in"'.

Helena Pettersson's paper "Multiple Masculinities and Gendered Research Personas. Between Experiments, Career Choice and Family", like Sigrid Metz-Göckel's paper, investigates why women scientists leave STEM disciplines and examines the masculine culture in experimental research settings. Her data is based on ethnographic fieldwork with long-term observations in a laboratory and in-depth interviews among experimental plasma physicists in the United States. The point of departure is that different identities exist side by side and are co constructed among physicists in the laboratory. Both senior and junior physicists emphasized the importance of a strong scientist identity. The plasma physicists represented a type of double hegemonic masculinity front stage. The scientific ideal was in itself strongly gendered. The physicists' identities were constructed through negotiation and interplay between masculinities performed at the work place and masculinities informed by career. This research, like White's discussed above, found that younger scientists were not prepared to work 24/7.

Ana M. González Ramos and Nora Räthzel's paper "'You Must Aim High' - 'No, I Never Felt Like a Woman': Women and Men Making Sense of Non-Standard Trajectories into Higher Education", examines two case studies from a much larger intersectional study of 80 men and women in different academic institutions across Spain. It presents the stories of a woman from a middle class but non-academic background and of a man from a working-class background. Their strategies in building careers can be understood as the result of specific individual trajectories under specific societal conditions, but they also illustrate the barriers and possibilities men and women with non-standard backgrounds encounter in academia. Analysing successful strategies as well as their limitations, the authors provide perspectives that might contribute to changing a culture of hegemonic masculinities in academia.

Bettina Langfeldt and Anina Mischau's paper, "Change and Persistence of Gender Disparities in Academic Careers of Mathematicians and Physicists in Germany" discusses whether gender-related disparities exist in the academic fields of mathematics and physics. They examine the application of career knowledge and the experiences of disadvantage in relation to recognition of performance, assessment of professional competencies, and integration into networks. To answer this question, they collected primary data using a structured online survey of graduates in both academic fields. The article considers a subsample of respondents working at a university or university of applied sciences and uses an intersectional approach. As well as the gender perspective, other factors that might potentially influence the academic careers of mathematicians and physicists were also considered, such as being in a certain subject, age cohort or having children. Some of the key findings were: more gender differences occur in mathematics than in physics; the experiences of disadvantage in the workplace constitute a cross-disciplinary phenomenon caused by the gendered academic culture; and more female than male academics in both disciplines accept constraints or abandon career goals due to childcare responsibility.

"The Triple Whammy: Gendered Careers of Geographically Marginalised Academic STEM Women" is the title of Clem Herman and Rachel Hilliam's paper which explores how gender and non-standard job roles as well as geographical location create a triple whammy affecting the visibility and therefore the career paths of women STEM academics. The data is based on interviews and surveys with 'Regional Academics' located at a distance from the main university campus, either in regional centres or as homeworkers, at a distributed university with locations across the UK. Findings show how gender intersects with distance and status to exacerbate inequalities. For this liminal set of staff, career progression has been limited, but the study concludes that

there would be only small steps required to increase visibility and provide recognition and reward for their achievements.

This Special Issue also includes Kate White's review of Man Made: why so few women are in positions of power, by Eva Tatchell and John Edmonds (2015). The book is based on interviews with over 100 successful women and a handful of men in the UK. The interviewees included parliamentarians, educationalists, trade unionists, business leaders, and those in the legal and medical professions. The authors argue that British society is 'made man', fashioned by men for the convenience of men. Their findings of a masculine work culture where men appoint men like themselves, non-executive directors being appointed informally, a strong sense of male entitlement, and the long hours work culture all resonate with much of the other research presented in this Special Issue.

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