Contents

Special Issue: Contribution to the open call on "Work - Life Interferences in Scientific Careers"
Guest Editors: Farah Dubois-Shaik and Bernard Fusulier

Introduction

Articles

Understanding gender inequality and the role of the work/family interface in contemporary academia: An introduction

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Abstract
This double special issue gathers a series of nuanced critically conceptual and case-study research showing that in the contemporary European context, despite regional differences in gender regimes, political and economic demands and organizational cultures, work/life balance policies and their translation into practice remains a highly ambiguous issue. Although work/life balance policies have undoubtedly entered the university institutional spaces, they are deterred by opposing institutional policy logics and particularly 'greedy' logics of the organizing of work that still aligns to outdated work-exclusive masculine organizational culture (outdated because men too are suffering the effects, and because the academic environment is feminized). Moreover, there are lingering gender stereotypes around the value and attribution of home and work duties, which are having a significant impact upon women's professional and private spheres and experiences in academic work. The gathered research shows how university institutions are still quite far from having addressed the core issues that undermine women's career advancement and their possibilities to access to academic membership and leadership, still obliging them (and their male counterparts) to align with a work and membership (selection and progression) logic and organization that does not take into consideration parenthood, family and personal spheres of life.

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If the sociologist Pierre Bourdieu could still use the expression 'man of science' in 1976 to embed his theorization on the scientific field (Bourdieu, 1976), today the university is largely feminized. However, despite this important change, the inequalities between the positions of women and men remain in terms of a scientific and academic career. Women's academic careers remain markedly characterized by strong vertical segregation. According to She Figures (2013), the proportion of female students (55%) and graduates (59%) exceeded that of male students, but men outnumbered women among PhD students and graduates (the proportion of female students stood at 49% and that of PhD graduates at 46%). Furthermore, women represented only 44% of grade C academic staff, 37% of grade B academic staff and 20% of grade A academic staff. Moreover, the under-representation of women is even more striking in the field of science and engineering, whereby the proportion of women among full professors was highest in the humanities and the social sciences, respectively 28.4% and 19.4%, and lowest in engineering and technology, at 7.9%.

These figures can underline in a photographic manner that a 'leaky pipeline' (Alper, 1993; Berryman, 1983) and a 'glass ceiling' (Hymowitz and Schellhardt, 1986) continue to persist in the academic world. The academic insertion of women is accompanied by their progressive evaporation in the advancement of the career ladder and their access to professionally high-value positions. A number of mechanisms, which dissuade or present hurdles for women in pursuing a scientific career, have been already well described in the literature: the structuring of the scientific field by a masculine habitus (Beaufays and Krais, 2005; Dany et al., 2011); the 'getting stuck' of women in less valued tasks, constituting a 'sticky floor' phenomenon (Booth et al., 2003); a 'Matilda' effect for women (Rossiter, 1993) versus a 'Matthew' effect (Merton, 1968) for men; the cooptation logic and the existence of the 'old boys' club': 'an informal but powerful collective of like individuals who either explicitly or implicitly signal whether full membership in an organization is granted or denied' (Case and Richley, 2012: 14); a work/family conflict that is particularly present for women (e.g. Barbier and Fusulier, 2015; Etzkowitz et al., 2000; Marry and Jonas, 2005). In view of this, it is hardly surprising that women who are engaged in a scientific career are often those who have the tendency to have fewer children (see Genis Lab, 2012).

Our assumption is that the university is a 'gendered organization' (Acker, 1990): it vehicles a 'gendered order' in its structures, its principle of organization, its customs and ways of doing things; in short in the practice of scientific work. This notably is connected to the old structure of the university built around a masculine figure: the 'professor of the university' or 'man of science' who is entirely engaged in his work, freed from domestic necessities by the presence of an invisible carer (the person taking care), in order to devote himself entirely and unrestrainedly to his work. The university has thus constructed itself upon a model of a 'greedy institution' (Coser, 1974; del Rio Carral and Fusulier, 2013; Grant et al., 2000; Hendrickson et al., 2011) expecting a total engagement in work, which is voluntary and passionate in nature; and furthermore upon a model of dissociation of work/family (Kanter, 1977), which by the way is characteristic of a labour society (Fusulier and Nicole-Drancourt, 2015). In this sense, it espouses a gender regime that distributes socially useful activities unequally between men and women. Because they are historically defined as heads or chiefs of the family (pater familias), the qualities of whom are presumed to be self-affirmation, technicality and rationality or strength, men are primarily assigned to the productive sphere and to paid work. In opposition, women are historically considered as sentimental beings, whose virtues excel in service-orientated relations, and are assigned to the familial sphere and to unpaid work. These forms of stereotypes which associate rationality to the masculine and emotivity to the feminine have contributed in construing 'science' as a masculine activity.

The feminist claims and the acquisitions in gender studies, which denounce and deconstruct naturalist arguments, have certainly transformed the university sphere. This latter proclaims itself to be open to women and sensitive to the requirements of individuals to reconcile their professional and family lives (one can find a recent example of this in the signature of the European Charter for

Researchers[1]). But the stereotypes are far from being completely delegitimized and have not entirely disappeared. Moreover, the university continues to construct itself upon the model of dissociation and of the sexual assignation of work/family. Even worse is that the institutional demands towards professional engagement are reinforced by the influence of a certain number of scientific and managerial policies, and thus framed by neoliberal influences. The latter accentuate the pressures of professional implication via a new regulation, such as: a pressure to produce, a pressure to be mobile, a pressure of competition and of 'accountability' (Thomas and Davies, 2005; Willmott, 1995). In sum, there is an 'increased tension' which characterizes the situation of researchers today (Fusulier and del Rio Carral, 2012), in a context in which the volume of researchers in precarious professional situations has increased, reinforcing competition towards the access to permanent positions, which are proportionally rare (Archer, 2008; Ylijoki, 2010). In its mode of functioning, its criteria of evaluation and processes of selection (Dubois-Shaik and Fusulier, 2016), the university always implicitly intervenes in private situations and the life conditions of its researchers, which does not or hardly takes into account the differences that remain between women and men and in their investment in the domestic sphere. The presupposition of a total engagement in the career and the institution obliges the researchers to adjust their private lives around their work, or to have the necessary strong support in order to realize their careers. This constitutes a gendered and masked demand of 'scientific excellence', of requiring to be a pure genius and 'lonely hero' (Benschop and Brouns, 2003), stranger to all ordinary considerations.

This special issue, based on an open call, has resulted in gathering research that adopts various conceptual, contextual and empirical angles, and demonstrates how much the pursuit of a scientific career interferes with private and family life, and how much this interference is gendered. This special issue aims at targeting the following indicative question: What are possible configurations, experiences and tools of work/family balance in contemporary research and academia in national and comparative contexts? Responding to this question, this issue gathers four sets of papers with four broad themes: 1. Neoliberalizing transformations and work/life balance practice in academia; 2. Gender roles and gendered systems in academic work/life balance; 3. Equality policies and their translation in work and life practice in academic/research institutions; 4. Crucial career and life stages and work/life balance.

A first set of papers deals with transformations in academic working systems that correspond to the idea of neoliberalizing policies, by looking at how these transformations rearrange spheres like family work and parenthood for 'academic parents'. A first paper illustrates through a German case how the ambiguity of freely configurable elements of academic work, such as flexible time management, are juxtaposed with experiences of an 'extreme acceleration' in the academic field in terms of productivity. These developments, the authors observe through discourse and biographical analysis, make it even more difficult for academic parents to reconcile family and science, ultimately showing a favouring of *childless* profiles for succeeding in the academic career (see Bomert and Leinfellner). Similarly, an Icelandic critical policy analysis and its translation in the academic institutional context raises questions about how work/life balance policies, although formally in place, can be deterred by neoliberal organizational logics (see Einarsdóttir, Pétursdóttir, Smidt). These logics include measures such as informal research production point systems, which rate the productivity of academics and researchers by granting points that give them easier access to funding and institutional membership. On the other hand, flexibility and the way academic work is organized today prevent parents being able to reconcile their work and family lives. Similar phenomena are addressed in the case of Polish female academics in a post-Soviet era, where equality rights are shown to be far from put into practice in academic institutions (see Czarnacka, Finkielsztein, Wagner). A host of configurations undermining women's academic careers, such as traditional gender roles, symbolic value of women's work, the absence of work/life balance policies and structures, the difficulty to reconcile children and careers, neoliberal influences of demands

of hyper-productivity and -mobility are identified amongst other reasons about why women are still far less represented in the academic institutions. Traditional gender ideologies are explored in a Czech case (see Vohlídalová), where the author examines dual academic careers. The difficulties of both male and female partners in finding the right configurations to advance in their respective careers is nuanced by influences from traditional gender roles, distributions in family caring and housework tasks, but also in the type of couple configuration (traditional versus egalitarian) we can find. Differences are observed between generations of couples, economic era and the demands of the labour market and the increasing demands of academic careers that play a major role in the way academic couples are able or not to fulfil their professional and personal aspirations. A Kazakh case study analyses in a nuanced way a host of possible reasons why women are less likely to attain academic leadership in university institutions in a Kazakh post-Soviet context (see Almukhambetova, Kuzhabekova). The authors critically examine a host of correlated phenomena, such as glass ceiling effects, the existence of old boys' clubs, psychosocial theories on self-confidence and motivation levels of women, economic regimes in different regions with differences in leadership rates and organizational work cultures. These sets of phenomena are shown to be contributing to low leadership rates for women, whereby low confidence levels, paired with masculine organizational work logics and gender stereotypes play a significant role. However, they discuss how larger cities with economic concerns tend to value the needs for leadership in institutions regardless of gender and are less prone to discriminate against women, showing how different economic demands and social norms conflict and play out differently according to regional priorities.

A second set of papers explores concepts such as academic housework and their actual translation in academic/research environment discourses and practices. The authors explore the perception and experience of 'academic housework' across six European countries, with different emphases and nuances between the genders and departments (see Einarsdóttir, Heijstra, Pétursdóttir, Steinþórsdóttir). Gender plays a role especially when it comes to certain undervalued tasks and how they are earmarked for women. The authors examine whether housework in the private sphere can 'spill over' to the academic sphere in the case of women. An important exploration is how the concept of academic housework can vary, but can also imprison certain academic tasks into undervalued representations and conflict with personal (and organizational) ideas of career progression and professional identity formation. Another paper depicting an Italian university case addresses the effects of socially constructed gender-based roles and gender-based systems translated in social institutions such as universities that reinforce the perception of mutual exclusivity between the role of mother and wife/partner and the role of the academic (see Biancheri, Cervia). They point out to the dangers of theories of 'balance' that are achieved by successful academics that fail ultimately to explain why so many women leave academia. The authors discuss how the persisting unequal distribution of sharing duties in families continues to distribute childcare duties more to women, which then impacts upon their share of professional duties, whereas men have a stronghold on the exclusivity of professional duties. A third paper with the theme of the domestic basis of academic work compares two national European case studies (France and Norway) in Science, Technology, Engineering and Mathematics (STEM) fields (see Brathen, Bry, Gaillard, Loison, Paye, Pelabon, Schermann Legionnet). The authors discuss findings on differences of success in academic careers between men and women, and point out various possible reasons such as the timing of crucial, stepping-stone and demanding career stages and family building phases, the distribution of work and family duties and the distribution of teaching loads. This article also shows the importance of taking into account the societal level in order to explain the variation between the phenomena in the same discipline.

A third set of papers critically explores equality policies, such as gender mainstreaming, and examines the conception of how equality policy is actually translated in work/life balance practices. In the first paper, the author shows how in Finnish academia equality reforms have not

brought about the changes that were thought to be the root of the problem, approached from a leaky pipeline point of view, of needing more numbers of women (see Lätti). However, these mainstreaming policies fail to neglect local organizational and national gender and work cultures, family structures, but also oppose policy logics of equality (individualist versus collective). Another paper critically examines equal opportunity programmes and policies for women in Germany (see Baader, Boehringer, Korff, Roman). The German case is discussed by showing how equal opportunities is addressed through exclusive and self-promoting programmes for women that ultimately penalize more than advance them, as the programmes focus on deficits, taking a lot of personal initiative and time investment. These kinds of programmes, the authors argue, deflect the equal opportunities issue from more subtle phenomena such as work/life conciliation, workload and pace and time pressures. Other types of equality measures, such as dual academic couple career services in European Higher institutions, are examined in another paper, which compares what the US offers with the emerging European services (see Tzanakou). The author points out the challenges that dual academic career couples face and what kinds of measures Higher Education Insitutions (HEI) can adopt in providing the right resources in view of these challenges that the 'two bodies' face in their careers and family life. These services are discussed by looking at how they address mobility in dual careers, career stages and progression and work/life balance in terms of stages of family building and career building.

A final set of papers explores questions about the precariousness of the postdoctoral phase and work/life interferences. Authors of a Swiss case study discuss how the erosion of the traditional academic career path is particularly significant while looking at why women and men may leave their careers (see Bataille, Kradolfer, Le Feuvre). They explore through different personal career and life path choices, socio-economic configurations as well as family structure configurations how career choices are very diverse and cannot be generalized for female and male postdoctoral fellows, but are always influenced by the 'greedy' nature of the academic institution, the overlap of work and life stages and the precariousness of the labour market in which the academic career is based. A second paper that broaches the topic of the postdoctoral phase is an Italian case study that explores three concerns raised for postdoctoral fellows: the question of changes in flexibility of the organization of work that makes boundary-setting increasingly difficult for young researchers in their work/life interferences (see Bozzon, Murgia, Poggio, Rapetti); secondly, the authors discuss how academic careers are increasingly precarious in terms of economic and professional stabilization due to their short-term character and lack of institutional membership; the third concern is raised by looking at how the postdoctoral phase coincides with family building and child bearing and rearing years in women's lives, and the difficulty of increasing institutional and career requirements. A further paper examining postdocs and tenured researchers in Belgium shows through narrative material the extent to which interference between working life and private life is an important dimension not only in the development of relationships to the scientific career of postdoctoral researchers (engaged, optimistic, ambivalent and distant) but also of 'winning' trajectories among female researchers having obtained a highly valued tenured position in academic space (see Fusulier, Barbier, Dubois-Shaik). The authors show how there is vast importance with regard to configurational support (both material and immaterial) that researchers find (or don't find) both in their professional environment (a supportive promoter, access to a carrier network, a well published article, benevolent colleagues…) and in their private milieu (few conjugal or family constraints, or strong support from parents and partner, easy access to services, living near the workplace…). The paper discusses how women have a more difficult context in terms of gathering and balancing these 'right' configurations than men for a host of reasons, and that this influences the way they experience their academic careers with respect to work and family interference.

This double special issue gathers a series of nuanced critically conceptual and case-study research showing that in the contemporary European context, despite regional differences in

gender regimes, political and economic demands and organizational cultures, work/life balance policies and their translation into practice remains a highly ambiguous issue. Although work/life balance policies have undoubtedly entered the university institutional spaces, they are deterred by opposing institutional policy logics and particularly 'greedy' logics of the organizing of work that still aligns to outdated work-exclusive masculine organizational culture (outdated because men too are suffering the effects, and because the academic environment is feminized). Moreover, there are lingering gender stereotypes around the value and attribution of home and work duties that are having a significant impact upon women's professional and private spheres and experiences in academic work. The gathered research shows how university institutions are still quite far from having addressed the core issues that undermine women's career advancement and their possibilities to access to academic membership and leadership, still obliging them (and their male counterparts) to align with a work and membership (selection and progression) logic and organization that does not take into consideration parenthood, family and personal spheres of life. Integrating a real strategy of gender equality in academia, promoting a women-friendly organization and contributing to reduce the work/family conflict are not in contradiction with the production of good science. They are, on the contrary, an opportunity to create a more efficient organization, avoiding discrimination on the basis of unscientific reasons.

Declaration of Conflicting Interest

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Note

1. http://ec.europa.eu/euraxess/index.cfm/rights/whatIsAResearcher (accessed 18 March 2017).

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Images, ideals and constraints in times of neoliberal transformations: Reproduction and profession as conflicting or complementary spheres in academia?

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Abstract
The article deals with structural, cultural and habitual concepts, principles and ideals of parenthood in the German academic working context. It focuses on social processes of transformation and reconfiguration of reproduction and profession, which means within work and family spheres and especially within academia in times of neoliberalism, economisation and globalisation. Discursive and biographical research results of two German research projects will be linked to trace current developments of gender relations concerning the compatibility of scientific work and family. Using an analytical governmental perspective, we reveal findings concerning the subject and identity formations of scientists and parents. The insights and conclusions obtained will be discussed and evaluated in terms of the interdependencies between the spheres of production and reproduction in neoliberalism.

Keywords
Parenthood, academia, models and ideals, entrepreneurial university, neoliberal transformations, subjectification, discourse

Introduction

Based on processes of reconfiguration within work and family spheres, this paper deals with concepts, ideals and principles of parenthood and academia in Germany. Specifically, it asks how the neoliberalisation of universities rearranges family work and parenthood, and how 'academic

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parents' handle the neoliberalisation of academic and family work. The article focuses on the demands that neoliberalisation places on dual-career parents engaged in science, because the mixture of neoliberal economic interests in academia and family interests becomes important when scientists decide to have children. There is a recognition of work and family issues in academia in Germany (especially at the institutional level), and couples and parents working in academia face this issue at the individual level.

In recent years, productive and reproductive work, such as parental employment and care responsibilities, have become subject to demographic and social changes that are embedded in neoliberal policies and framings. Following Foucault, demands, standards and expectations in times of neoliberalism – due to new forms of political government and to a revaluation of societal values (Lemke, 2006) – can be described as 'practices of "self-governance"' (Lemke, 2006: 470). In neoliberalism, the new course of market-oriented reform and liberalisation sets the standards for self-optimisation and privatisation within an increasingly technological, globalised world of control and surveillance systems. The principles of economisation guide an individual to become an entrepreneur and act independently and self-sufficiently in both the private and work spheres (Sauer, 2008). These demands, or subjectifications, can be seen and understood as practices and discursive effects of a social field.

This article aims to offer new methodological tools by linking together discursive and biographical research in order to reveal the subject and identity formations of parents in academia. Theoretically, the paper is grounded in a (gender-sensitive) Foucauldian approach, referring in particular to Foucault's governmentality concept. So far in the field of governmentality studies, empirical contributions are rather rare; furthermore, biographical studies usually do not focus much on discourses, and vice versa. Using an analytical governmental perspective (Tuider, 2007), here we link and assess the discursive and biographical research results of two German projects to trace the interdependencies between the spheres of production and reproduction and current developments of gender relations concerning the compatibility of scientific work and family. More specifically, we will intertwine the empirical data from a discursive analysis and from an interview analysis, leading to findings that concern the gendered subject and identity formations (of scientists and parents) and address the question of how gendered subjects locate themselves within their specific subject positioning (Tuider, 2007). Gender-specific aspects within neoliberal discourses and processes of restructuring link freedom, economy and masculinity on the one hand, and dependency, welfare and femininity (Sauer, 2008) on the other. Therefore neoliberal invocations and requirements carry a subtext of restoring traditional gender relations. The double-blurring of gainful employment and family can be viewed as a result of the transformation process from the Fordist to the post-Fordist model of society. Both in public and in private life, this change leads to a reorientation of gender relations – as a result of, amongst other things, the increasing female labour force participation. Post-Fordist models of society are characterised by a progressing 'economization of the political and the social' (Sauer, 2008: 26) – intersecting with new neoliberal structures in the higher education sector.

Concerning the structure of the following paper: first, the article describes the methodological fundamentals and the underlying research design. As an introduction, the governmental perspective of Foucault is described, which makes it possible to analyse novel patterns of subjectification and theoretically link the discursive level of knowledge and the subjective level of acting. Both levels are captured by the triangulation of discursive and biographical analysis. The section 'Triangulation of discursive and biographical analysis' explores, on the one hand, methodological terms of a discourse analysis about balancing academic careers and family. The analysis is based on information brochures of family services and on articles of preselected scientific magazines and

leading media. On the other hand, this section outlines the conceptual background of the second analysis of problem-centred, biographical interviews with career-oriented couples (respectively, parents). The results of this intertwinement are then discussed in a section which pays special attention to the academic career track in times of neoliberalism. This section discusses the following subjects: the simultaneous occurrence of traditional and neoliberal ideals within the German discourse of parenthood and academia, mobility requirements in academia and commuting arrangements, demands of the work–life balance conflict in private and professional life and the performance of dual-career parents in academia. After discussing the insights and findings against the background of taking a closer look at neoliberal reconfigurations against the background of gender (specific) subtexts generally, the paper concludes with a methodological résumé.

Research design and methodological approach

The governmental perspective of Foucault

In the second half of the 1970s, Foucault attempted to extend his theoretical analysis of the 'genealogy of power' to the concept of governmentality (Lemke, 2006: 469–470). His 'genealogy of power' focused on the realm of power regarding struggle, war and confrontation (Lemke, 2001), but it brought the political level of the state and the subject increasingly into focus by adopting a governmental view (Gertenbach, 2007: 19). In concrete terms, his analysis implies and concludes 'the relation between subjectification forms and forms of power' (Lemke, 2001). The term 'governmentality' was selected because of its 'pivotal function': it describes the mediating that occurs between the power and the subject. It enables us to explore 'how governmental technologies [are] connected with "technologies of the self" and how forms of political governance revert to practices of self-governing' (Lemke, 2006: 470). Within neoliberalism, the state pursues new tasks, in addition to its traditional functions, such as developing indirect techniques: Foucault conceives governmental technologies not only as a disciplinary power that influences the subject from outside, but also as 'technologies of the self' which empower subjects to perform self-guidance and self-care (Radzioch, 2015: 47). These techniques lead and guide individuals without being responsible for them directly (Lemke, 2011: 254); they target a 'change of government' which acts on the subject through the discursive production of trueness (Michalitsch, 2008: 63). Following Foucault, discourses have social power that, by their constructed reality, is used by the subjects to orient their thinking and acting. To put it briefly, discourse shapes the consciousness and it creates the subject. Foucault considers power as omnipresent both in social relationships and in the subject's dealing with oneself/itself (Michalitsch, 2008: 79 et seq.).

In the beginning, the subject in Foucault's work had no space to actively participate in its own process of subjectification; however, later writings have accentuated the 'simultaneity of submission and self-management' (Tuider, 2007: fn. 11) and therefore the constitutive role of the subject within its own formation. According to Foucault, power can only exert a significant influence on 'free subjects', meaning 'individual and collective subjects with a variety of different opinions: several leaderships, several reactions and different behaviours' (Foucault, 1987: 255). The subject is conquered by 'the regime of the specific discourse's meaning', but it is also 'able to act accordingly' (Weedon, 1990: 51, quoted in Jäckle, 2011: 32 et seq.).

Although the concept of governmentality does not conceptualise a completely autonomous subject, it originates an actor which is able to act for themselves and others. The concept therefore forms the link between the discursive level of knowledge and the subjective level of acting (Radzioch, 2015: 47).

Triangulation of discursive and biographical analysis

Based on the foregoing statements, by triangulating discursive and biographical research (examining discursive level of knowledge and subjective level of acting) one can analyse novel modes of subjectivations considering transformation processes in work and family spheres, and in academia in particular. This allows one to explore the biographical effectiveness of discourses (Spies, 2009: sect. 4) – a frequently raised methodical question in social research. Therefore the present article will use Tuider's suggested, exemplarily conducted triangulation of discourse and biographical research methods (2007) with a governmental perspective.

So far, comparatively few studies have applied such triangulation that goes beyond a mere discourse analytical evaluation of the biographical material (cf. for instance Gutiérrez Rodríguez 1999) and aims to achieve an 'interpretative confrontation' (Teupen, 2015: 41) of discourse analysis and reconstructive analysis (cf. for instance Freitag, 2005). This coupling of discourse analysis and biographical research also appears to allow 'getting to grips with the deficits of both traditions of research' (Göymen-Steck, 2011: 266). For example, biographical research is often criticised for giving insufficient priority to the discourse surrounding the subject and the influence of subject positions. And discourses, while they do take into account aspects such as their 'reality-making (type of) power' (Bührmann and Schneider, 2007: sect. 11), when they are used to construct novel modes of subjectification (Ludwig, 2006), they do not very precisely analyse these aspects. Thus, against that backdrop, our coupling approach may be methodologically fruitful for the further development of both research traditions.

The first part of our triangulation step consists of interpreting a discourse analysis about the reconciliation of scientific career and family. The data material is composed of three discursive levels (Jäger, 2004: 338) comprising 32 family services information brochures for academic staff at German universities[1], articles from six preselected scientific magazines[2] and articles from three leading media sources[3].

After mapping the discourse concerning parenthood in academia, selected parts of biographical interviews with heterosexual, career-oriented couples/parents (mainly employed in academia) will be analysed. The empirical data have been collected through semi-structured, problem-centred interviews (Witzel, 1982) with dual-career-couples aged 35 to 55 who have been asked about their professional and personal biography. The main criteria for sampling the interview partners were the following: both partners have a strong occupational orientation, both follow independent career tracks, at least one partner follows an academic career path at the professorship level and they live together with children aged 0 to 12 years old. The sample contains couples in academia as well as mixed couples working in academia and in economic areas: couples consisting of professors, professors with a partner employed in research management or at research institutes and professors with a partner working in the economy or in their own business. The interviewed families have mostly been recruited with the help of so-called dual-career services at German universities. After the United States started to implement dual-career services at universities in the 1990s, 'entrepreneurial universities' in Germany followed suit. All interviews have been analysed within a case-by-case analysis and a qualitative content analysis (Mayring, 2010).

On the academic career track in times of neoliberalism

In times of neoliberalism, it is a major challenge to pursue an academic career track. Resulting from European and national university reforms at the end of the 1990s and the beginning of the 2000s, profound changes within the higher education landscape can been identified. They attribute 'an increasing importance in competitive oriented institutional structures' at universities (Klammer

and Ganseuer, 2013: 17). The introduction of New Public Management strategies at universities in the form of 'new mechanisms of result- and production-oriented controlling and an allocation of funds based on ex post controls (final controls of results)' (Zimmer et al., 2007: 44) is intended to enhance the transfer of autonomy and autonomous efficiency. At the same time, these principles of economisation are (mostly indirectly and unconsciously) instructing the subject as a neoliberal self in the private and work context (e.g. as a parent or scientist).

Within the framework of competitive 'entrepreneurial universities' (Riegraf and Weber, 2013: 67) gender equality policy measures gain a new importance within the credo of excellence in science and research. With the help of activities such as the Excellence Initiative or the Programs for Women Professors at the German federal and state levels, competition for external funding is politically initiated. Thus, universities depend on the success of this competition to contribute to their (financial) endowment and reputation. The result is that competitive structures and financial incentives are combined with gender equality policies (Riegraf and Weber, 2013: 68) and that universities promote gender equality policies like Gender Mainstreaming and Diversity Management, even if their effectiveness, particularly regarding employment relationships, is still unclear. However, what can be shown is that such programmes have an impact on the orientation of universities (Müller, 2010) and that the entrepreneurial university leads to a reorganisation of research and teaching within the German context, as illustrated by academic employment relationships which are being increasingly influenced by uncertainty and the precarisation of contemporary labour. Since the European and national university reforms new conceptualised jobs have been introduced for teachers where they are asked to perform special tasks with heavy teaching loads (up to 18 semester periods per week) and take on the additional task of supporting young academics; many fixed-term and part-time work contracts have been introduced for mid-level faculty; and performance bonuses have been established for professors' salaries. These (and other) aspects of the German Higher Education system are considered in this article, although we are aware that similar problems and circumstances apply in other European and non-European countries and academic systems. Labour markets and working conditions in science have deteriorated significantly in Germany but also, for example, in the French university landscape (Costas et al., 2014: 2). However, in France, 65% of university faculty staff have predictable contracts (e.g. tenure track positions); in Germany, only 25% of faculty staff have such contracts (Costas et al., 2014: 8). One crucial consequence of the small number of faculty staff with predictable contracts is the rising mobility of academics, along with commuting arrangements in couples and families who are employed in academia. By focusing on the work/family conflict, this aspect will be part of the interview analysis.

In summary, labour markets and working conditions in science and in industry have considerably changed since the shift towards neoliberalism. As a result of the structural and organisational parameters of neoliberalism, precarious employment conditions along the academic career track are increasing. One of the professors interviewed in the qualitative study describes his own career path and that of colleagues in academia as 'financially precarious' and even 'existentially precarious'. The main reason for these shortcomings is the lack of human resource development strategies at the structural and organisational level of universities that takes little account of the academic staff below the professorship level. But, an open question remains: what are the implications and consequences of the current transformations of the academic career track and, specifically, how does this affect the compatibility of scientific work and family? The described governmental policies in higher education result in an unsatisfactory situation for departments and teams at universities because they are not able to plan and manage personnel requirements and project contents. Facing uncertain working conditions himself, the above-mentioned interviewed professor concludes that 'generations of young researchers are currently being scrapped' (interview statement).

The German research system is a system that not only 'accepts the destruction of academic personnel and personalities' but also accepts 'the loss of scientific knowledge' (interview statements) at universities. Beyond the larger groups of universities and research teams, individuals employed in academia are also unable to act and plan the course of their professional and private lives in a forward-looking manner – climbing an unsteady, uncertain and discontinuous ladder up to professorship. And this ladder is even more uncertain for women: on the one hand, women face the convergence of a rising number of women in academia and, on the other hand, a male-dominated work culture at universities (compare with the following discourse analysis) and the lack of any fundamental change of reproductive labour (the public–private division). All dimensions of this conflict can be seen as crucial dynamics of neoliberalism, and they converge in the work/family conflict when balancing the daily family life and the demands of the academic career track, academic competitiveness and academic performance.

Analysing the German discourse of parenthood and academia: Convergence of traditional and neoliberal ideals

In the light of the call for more equal opportunities and family equality in the higher education system, universities consider the reconciliation of study, work and family as a significant challenge to employees with care obligations for children or relatives. Parents 'must be helped with a specific work organisation' (Arbeiten & Familie, Universität Erfurt). An increasing number of universities are performing this task with their specifically established service centres for families, employees with care obligations and dual-career couples. These family service centres see their family-oriented commitment as a 'progressive obligation' (Familienbewusstes Arbeiten und Lernen, Hochschule Bremen) and as a necessity to react to demographic developments. First, the data show that the structures a university offers for parents to reconcile work and family life (structures of reconciliation) are linked with the discourse of skills shortage against the background of the demographic change (below with regard to the medical field):

> The lack of structures of reconciliation is leading to problems in finding new recruits and it coincidentally strengthens the so called 'glass ceiling' which keeps women with children away from excellent career positions. The lack of above-average committed young medical experts who have decided to take on more elaborate career paths is more and more being bewailed (CEWS – 4).

Second, the discourse about parenthood in the academic working context is primarily attributed to women, which means that female scientists are discursively made into subjects of reconciliation. Third, structural measures (such as childcare facilities) receive special significance in the analysed discourse. Structural measures are being seen as a central aspect of family orientation. And, fourth, in addition to the structural level, the discourse also thematises the convergence of traditional and neoliberal ideals as well as the interrelation of these influencing dimensions. The ideal image of the 'academic personality' and the 'traditional picture of a scientists' both stem from a male-dominated work culture. This culture, oriented towards the male standard biography, ascribes less motivation and performance in the science working context to mothers (and fathers as well), while at the same time reproduces the breadwinner-model ideals of parents who are sceptical about motherhood in science and ignores the changes that have occurred within the academic working system in Germany.

Different norms and ideals which can be regarded as traditional seem to link with neoliberal reconfigurations within the university working context. These contradictory developments (and lines of argumentation) are particularly visible in the discursive and biographical analysis conducted here. The discourse about parenthood in the academic working context is unmistakably still

a topic attributed to women: 19 of the 21 analysed leading German media articles focused predominantly on the low share of employment and the support measures for young female scientists and female professors. In science, the challenge of balancing work and family is almost exclusively addressed to women. In this manner, women are 'directly being made into (potential) mothers' (Paulitz et al., 2015: 137), as concluded by a qualitative study of gender construction in academia. In the context of this traditional allocation of responsibility, structural measures receive special significance, as conceiving childcare provisions are a 'central aspect of family orientation' (HM-3, 2011). Furthermore, following neoliberal principles, family orientation at universities is considered to be a competitive advantage and a necessary step to combat demographic developments and skill shortages, without considering possible different interests of all target groups involved in the academic area. As a result, for universities family orientation is deemed to be a 'double opportunity'; they must perform their 'social responsibility for more family orientation' as well as 'foster excellence in research [via women's promotion programs]' (FuL-1, 2012).

The convergence of traditional and neoliberal ideals is particularly clear if we consider the established ideal of scientific employees within current transformations at universities. On the one hand, the ideal image of the 'academic personality' (Kreissl et al., 2013: 26) (which contains a time-efficiency, usability and marketability orientation) is a dominant object in the discourse that is responsible for the low number of female scientists, structural working conditions, childcare provision, the missing financial protection and the lack of planning security for life. This 'traditional picture of scientists' (DUZ-2, 2011) affects also family planning backgrounds/structures (particularly with regard to the dream of having a child and childlessness); for example, junior researchers and female professors are being ascribed with a desire to have children and this wish will be fulfilled – according to this view – 'if there are no academic or social requirements or other conditions based on partnerships' (Kahlert, 2013a: 142). This aspect highlights explicit family-centred, hetero-normative values while also reproducing an understanding of childlessness that is understood as a 'price for the academic career, but no wanted result of individual life planning' (Kahlert, 2013b: 46). That leads to the converse argument that the specific difficulties involved in reconciling family and academic work are the reason for the low number of women in leading positions in academia: 'Women are even missing in academia. (…)The reason for this is the bad compatibility of career and children' (SdZ-1, 2012).

On the other hand, this 'male dominated culture of work' (SdZ-7, 2010) that coincides with the 'traditional picture of scientists' is not really affected by the changing circumstances and processes of economisation in science. As the biographical interviews show, scientists are expected to optimise their working procedures, research and teaching activities within 'entrepreneurial universities' until total exhaustion. Against the background of the 'adult worker model' (Lewis, 2000) these economic demands also include women. The discourse clearly illustrates, when women are addressed, that mothers have to 'perceive themselves as human capital' and that universities 'are entitled to the resource of females' (Thon, 2015: 135). In contrast to the traditional gender role models in academia, the analysed discourse addresses the neoliberal-motivated fear of losing excellence in science due to the deficient structures for the compatibility of family and working life.

Both lines of argumentation and the prevailing ideals reveal a conflict: the 'subject construction of the "rational female manager of her own human resources" is acting contrary to a caring/thoughtful and emotional femininity' (Ludwig, 2006: 56) and to a traditional role of motherhood as addressed in the discourse. Therefore, contradictions in female invocations are emerging, which, within neoliberalism, must be resolved autonomously. While offering childcare provision represents a central measure of addressing the female subject's problem of balancing career and family in academia, no new (gender-equitable) academic working culture has emerged despite the changes and increased demands in science.

Interviewing dual-career parents in academia

After mapping the current discourse concerning the compatibility of science and parenthood through evaluating information material relevant to the subject matter (brochures and scientific media), the aim is now to focus on the subjects of reconciliation, their modes of subjectification and ways of reconciliation in practice. Professors and their partners (as academic identities) report how they balance their daily lives in the world of work and family and in terms of neoliberal invocations that aim at self-optimisation – often purely economically oriented. In the following, two aspects or crucial dynamics in times of neoliberalism will be focused on: mobility requirements in academia and commuting arrangements on the one hand, and demands of the work–life balance conflict in private and professional life and the performance of dual-career parents in academia on the other hand. The interview study draws attention to dual-career couples in academia because the careers of men and women in science continue not to be realised equally, although dual-career couples are often portrayed as – and expected to be – pioneers in balancing work (more precisely two careers) and family. The authors translated the interview statements and the German quotes from German articles from German into English, and tried to keep them as close to the originals as possible.

Transnationalisation, mobility and commuting arrangements. Current transformations at universities in the EU are characterised by the interrelation and intertwinement of processes of transnationalisation and economisation (Münch, 2009: 1). Processes of globalisation and transnationalisation are reflected implicitly in increased mobility requirements and demands for flexibility along the academic career track. Besides that, precarious and uncertain working conditions in academia – that, for example, go along with fixed-term work contracts and the lack of commitment to academic staff below professorship level in Germany – increase and intensify mobility and flexibility demands for those on the academic career track. Facing mobility and flexibility paired with high performance requirements and temporary, marginal employment conditions, dual-career couples in academia have to doubly cope with these challenges on their way to reaching the professorship level – or drop out of the leaky pipeline beforehand. And as we already know, women are (even nowadays) still mainly responsible for managing work–life balance challenges; it is mostly women who drop out of the academic pipeline.

Career-oriented couples often realise their mobility needs by establishing commuting arrangements between home and work. In academia in Germany this is a significant issue, considering that professors are frequently contractually bound to have (or move) their primary residence in(to) the region of the university. Without exception, all of the interviewed couples in the study have moved several times and have gone at least once through periods of commuting with their families. Both women and men experience these arrangements as burdensome, stressful and difficult to reconcile with daily family life (interview statement): 'That was exhausting. […] Commuting costs a lot of time and energy. […] In the end, I was tired of it.' The interviewee stresses the benefits of not having to commute, and explains that he enjoys spending time with his family and arranging daily time schedules and routines together. The interviewed families made every effort to terminate commuting situations as quickly as possible, even though they were aware that mobility and flexibility requirements represent key factors in their career tracks. 'We noticed: to stop commuting was important for the whole family and our daily life' reports another interviewee, who gave up a leading position in a company after his wife accepted the call to a full professorship at another university and in a new city. A third (female) interviewee also emphasises the shared experience of daily life routines and the close daily contact with her children – not on the phone, but in person: 'I'm way more satisfied and well-balanced than during the year when I was commuting. I see the kids every day and I know everything is all right'. The rules of mobility in academia are not compatible with family needs in terms of routines, reliability and calculability in everyday life and in social networks.

Commuting (like the birth of a child[4] (compare for example Abele, 2010; Rüling, 2007)) can turn into a traditionalisation trap or inequality trap. Results of the interview analysis verify that commuting arrangements possibly raise gender inequalities in relationships: in one of the interviewed families, the woman was commuting from Tuesday to Thursday. Her partner was responsible for the house and care duties while she was gone, and she was mainly responsible for these duties from Friday to Monday. Besides and further to this, she took care of work and things that were forgotten during the week. In another family that had been interviewed, the man was the one that commuted. In this couple, she was responsible for housework and family when he was not at home but also (at least mainly) when he was home. Obviously, this means that female scientists are discursively made into subjects of reconciliation, no matter if they are at home or if they follow their own career tracks. Therefore the interview study confirms the results of other German studies (for example Behnke and Meuser, 2005), which examine highly qualified dual-career couples.

Career decisions made by dual-career couples represent turning points and milestones in (family) life that can change gender relations. One of the careers can be given priority and working arrangements can, for example, change in favour of the male career track at an early stage. Nevertheless, the interviewed couples stress that they try to realise gender-equal structures in their relationship and family. One of the interviewed couples reflects that they always tried to keep both careers in mind while deciding the next career steps in their partnership, and that they switched between whose career took precedent (interview statement): 'We came to the agreement that I put back first in favour of his job. And in case I will be offered a permanent position in academia, he would put back and follow me.' And she was offered a professorship.

Facing transnationalisation and brain-drain/brain-gain effects, German universities started to implement so-called dual-career services. Assistance support programmes at numerous universities were set up to help dual-career couples in academia with the reciprocal coordination of two careers and while settling in a new location (compare Melzer, 2010), given the requirements of geographically mobility and temporary flexibility in systems of academia. The United States started to implement dual-career services at universities in the 1990s (fighting to keep the best researchers in their country); nowadays, the 'entrepreneurial universities' in Germany, as increasingly highly competitive institutions and workplaces, have followed this idea. But, German universities often do not understand dual-career support as an 'instrument of family support in their organization' with the aim of 'overcoming previous barriers in careers' (Woelki and Väth, 2010). They do not use the dual-career topic to push forward gender equality within their institutions. Instead, they mainly follow neoliberal interests when implementing New Public Management strategies, when addressing women (as subjects of reconciliation) to activate female 'human resources' and when implementing so-called dual-career services. As argued earlier, the motivation of universities for support measures such as childcare, family orientation and dual career is mainly a neoliberal one that focuses on recruiting excellent researchers – instead of focusing on gender equality at an institutional level and in society as a whole. Therefore, measurements that carry the subtext of 'Gender' often correspond with economically oriented, neoliberal New Public Management strategies. The fact that the dual career is primarily taken as a competitive advantage within the academic competition for excellence is also reflected in the target group of dual-career measurements. German universities (often exclusively) offer their dual-career service features to professors and their partners, excluding mid-level faculty and junior researchers.

Highest demands balancing work and family and the academic performance record

We do have a weekly schedule, the way we are organised during the week, that changes on a daily basis. […] We distinguish between the lecture period and lecture-free time. Monday is precisely worked out. Sometimes I'm teaching from 2 until 4 p.m. on Monday and sometimes I'm completely taking care of family responsibilities on Monday. On Tuesday, it is my turn and I'm on my own with our daughter,

> Wednesday the same. […] Thursday is father's day and Friday as well. […] On Saturday and Sunday, all three of us try [to undertake; S.L.] something together. (interview statement)

The already given 'double socialization' (Becker-Schmidt, 2003[5]) is increasing within the dual-career family model and in the neoliberal academic working context. The interviewees were invited to talk about their daily lives in detail in the interview sessions. In the above-mentioned interview statement, one of the interviewed professors (with one daughter and a partner who commutes to another university) talks about daily life routines, taking into account schedules, working times and care responsibilities. The couples try to relieve their daily schedules with the help of thought-out timetables and routine processes (interview statement): 'We plan our daily life well ahead!' But managing work and family demands gets even more difficult when structured systems and routines become brittle and fragile when an unpredictable event has to be dealt with, such as when a child gets sick (for example a 'fever emergency') or when a parent cannot perform for health reasons (interview statement):

> It is getting critical when we are not functioning. We had that before. […]: You returned [from a conference; S.L.] and then suffered from a migraine attack because you came home exhausted. And I had to take care of the supervision of our daughter for another few days but had totally different (working) plans on my mind. Disastrous! We have to be able to perform!

The couples are confronted with highest demands and requirements balancing work, two career tracks and family. In academia, they have to teach, restructure and develop new degree programmes, as well as handle increasing numbers of students, committee work, meetings and bureaucratic burdens. At the same time, they face academia-specific challenges on their dual-career tracks, such as the previously mentioned precarious and borderless working conditions or a male-dominated work culture. Several interviewees reported that they often experience exclusion as a parent in academia, and also do not feel that their supervisors and colleagues understand the difficulties they face regarding care responsibilities. It is in this context that we have to keep in mind the high rate of childlessness in academia in Germany[6] – especially among female scientists on their way to the top (interview statement):

> None of my colleagues had children. […] I was the only one. And meetings were scheduled on the weekend or after 6 p.m. and open-end, of course. And I said: That doesn't work for me! […] In the following, you are cut off information, discussions and decisions.

In social contexts, scientific scholarship came to be understood as a lifestyle that takes for granted a complementary and unequally shared division of labour; this idea of scientific scholarship still focuses on the entire subjectification of the (entrepreneurial) self. As such, this idea of scholarship encourages women to decide against having children or leave the academic career track. Most of the interviewed couples refer to situations where they had to justify and defend their way of life. In such conversations, they also sensitise and alert their conversation partners to work–life balance topics and changing gender relations, while demonstrating a kind of 'missionary awareness' as subjects of the work–life balance conflict. As expected, the interviewed females showed greater 'missionary awareness'. A female professor described such a conversation with one of her colleagues (interview statement):

> One of my colleagues holds a professorship and his wife works part-time. He once told me regarding our work–life balance to take a step back at work and decide for a part-time position. I told him that he can talk. But would he as well take a part-time position? He had never even thought about it. For him, it was a matter of course that women can reduce their working hours. It was no option for himself. But at least, my question caused confusion.

Colleagues as well as family members and others addressed the interviewed female researchers directly as subjects of reconciliation and made them (feel) responsible for care duties and managing the work–life balance conflict on their own. If necessary, it is expected that the women will give up their career aspirations. As most of the interviewed couples emphasise, it is not research itself but mostly family-unfriendly scholars ('the persons acting in the academic system' (interview statement)), a male-dominated work culture and the organisation of university that makes academia incompatible with family life. It is not surprising that exhaustion turns out to be a predominant symptom among the interviewed dual-career couples – especially among the females. Some of them feel overwhelmed, burned out and physically as well as mentally exhausted. The interview analysis indicates that neoliberal transformations in academic working systems can produce exhausted and uncreative human capital among young researchers (interview statement):

> At one point I thought: It is no longer possible! I can't stand it any longer! […] Even physically! […] I always had the strong feeling of lagging behind and having no resources for things I love to do at work: […] dealing with contents, reading or even writing an article. […] I felt extremely frustrated. […] An unsatisfactory situation. […] A high dissatisfaction concerning my professional situation.

The interviewed professors mentioned that they had been encouraged to optimise the management of their work–life balance, their family structures and their working procedures to effectively exploit time frames and work outputs until exhaustion. An interview from a couple who work in research mentions that the 'main logic of this job is to constantly move on'; there is a logic of performance orientation and of an 'increasing imperative' (Leinfellner, 2014: 88). The interviewees notice an 'extreme acceleration' in the academic field in times of neoliberalism that makes it even more difficult to reconcile family and science. But, as architects of their own fortune, the academic identities themselves and also the (female) subjects of reconciliation follow neoliberal principles when assessing their market-oriented potential and their competitiveness in the global scientific competition. A professor remembers the intense period after giving birth to her daughter:

> When I decided to do research it was obvious to me that my work is my life. […] I had internalised that concept and idea of work totally when I decided to become a researcher. I pushed myself to the limits. […] And I remember that I always took something with me, to work on, when I went on a walk with my daughter when she was very little. As soon as she fell asleep I started working immediately. Each and every minute. A high level of efficiency […] but a lot of pressure as well.

And the following final interview statement also shows that the interviewees unconsciously internalised neoliberal invocations like that of self-governance (Lemke, 2006: 470):

> You can take into account that there is a huge flexibility in the academic working context. You do things for yourself when doing research. That is comparable with being self-employed. […] You will be left stranded in case you do not watch your performance record!

Neoliberal reconfigurations against the background of gender-specific subtexts

Foucault's concept of governmentality presents a microscopic view of governmental technologies of power. It offers a way of looking at the power and mentality structures of the state in relation to the leadership of the population (Gutiérrez Rodríguez, 2003: 164) – shedding light on the relationship between day-to-day micro-technologies and abstract political rationalities. This makes it possible to analyse the patterns of subjectification that are produced by these political rationalities and governmental technologies, such as via concrete institutional practices and technologies of power as well as discourses (Thompson, 2013: 201).

In this paper institutional practices and technologies in academia and the prevailing neoliberal discourse about parenthood in this context have been the primary focus. According to Foucault, discourses correlate closely with social institutions and with ways of living (compare Tuider, 2007: sec. 8). This connection of the discursive level of knowledge and the subjective level of acting (Radzioch, 2015: 47) could be demonstrated by linking together discursive and biographical research. It became clear that institutional discourses and individual experiences reproduce neoliberal requirements that are shaping the subject as an entrepreneurial self, having to act independently and be self-sufficient both in private and in professional spheres.

For explanation: the analysed discourse that is primarily attributed to women as well as individual experiences (one of the questioned female professors, for example, reported on the obvious assumption of colleagues of stepping back at work as a woman and deciding on a part-time position) clearly show that primarily female subjects are the ones who concomitantly reconcile. But, as already mentioned above, the traditional role of motherhood is acting contrary to the 'rational female manager of her own human resources' (Ludwig, 2006: 56) or, better still, to the ongoing traditional picture of scientists (compare for instance DUZ-2, 2011). This coexistence of opposing principles (compare Fusulier 2016: 300) can be defined as a new aspect of gendered subject constructions of and in neoliberalism leading to the fact that the asynchronicity is shifted 'into' the female subject where it becomes a circumstance of self-responsibility. 'Female subject constructions oscillate between the flexible female "Entrepreneur of the Self" and the caring femininity' (Ludwig, 2006: 57). From a feministic perspective, the theory of governmentality opens up a concept that allows us to describe and criticise neoliberal policies and their mechanism of shifting self-regulation and self-responsibility. These mechanisms are, however, not regarded as gender neutral; they have to be understood as androcentric (Ludwig, 2010: 47) and as *gendered* forms of subjectification (Kerchner and Schneider, 2010: 17). Only this understanding enables one to realise specific or rather contrary invocations to the subjects, and it inevitably considers the gendering of governmentality.

But the invocations and attributions do not take place in a space free of preconditions. Working in the scientific context is characterised by precarious employment situations, mobility requirements and flexibility demands towards the scientist (compare the section 'Transnationalisation, mobility and commuting arrangements') as well as a double-blurring of gainful work and family (compare Fusulier 2016: 301). Besides that, gender assignments conform to contradictory demands of productive and reproductive spheres following different principles and needs – especially in terms of time. As pointed out in the couple interview analyses, interviewees responded to neoliberal demands with tightly scheduled and well-organised timetables and flexible work hours. They reproduce neoliberal requirements and invocations as supposedly liberally acting subjects of reconciliation. And because the images, ideals, principles and discourses of academia and of parenthood continue to be male dominated, they reproduce the power and effectiveness of gender norms and hegemonic structures of society, and therefore the incompatibility of scientific work and family life. 'Real power relations and traditional social images have always been maintained with the help of ideologies' (Nave-Herz, 2014: 732). A male-dominated academic ethos on the one hand and neoliberal invocations and ideals of parenthood on the other affect guiding-principle discussions and discourses in public/professional and private sectors. The popularity of the reconciliation topic and work–life balance in practice illustrates the power of discourses and its interdependencies.

Besides, precarity in the academic working context and in everyday life can be understood and taken (as) governmental. In our perspective, precarity can not only be seen in a repressive form, it is also an ambivalent and productive moment as it arises in techniques of self-government (Lorey 2011). The way that this study's interviewees keep in mind how to enhance their efficiency or how they split care obligations (for example delineated in the section 'Highest demands balancing work and family and the academic performance record') shows that the individual is always an active subject, a subject with agency. 'The active participation of everyone within the reproduction of

governmental techniques does not serve submission solely. (…) Within the ambivalence between submission and empowerment self-government can enable to fight for the manner of leadership' (Lorey, 2011). According to Foucault the room for manoeuvre is, however, discursively structured, thus allowing the subject to act accordingly. It is therefore particularly essential that institutional discourses and individual experiences are subject of any critical analysis.

Within our data we could see institutional discourses and individual experiences reproduce neoliberal requirements that shape the subject as an entrepreneurial self, having to act independently and be self-sufficient both in the private and in professional spheres. Neoliberal ideology promotes the working life/family life conciliation not as a goal but as a way to activate 'human resources', in particular female human resources. Contemporaneously, universities (economically oriented, competitive and entrepreneurial) and a traditionally male-dominated culture (masculine habitus) have been connected with the New Public Management framework (neoliberal ideology). In this context, the credo of excellence in science, research and teaching means that academics should be more productive, competitive, mobile and accountable in a quantitative sense. So, researchers are under considerable pressure, and often in a precariousness employment situation. As a consequence, the combination of taking care of children and working in academia causes an immense lack of time and competition for time. In fact, the neoliberal transformations in academic working systems and their demands for performance reinforce work/family conflict in academia (also compare Fusulier 2016: 300). Behind the discourse on reconciliation, and which becomes very clear in our study, we see a structural deficit combined with an institutional and cultural requirement for individuals to resolve the work–life balance conflict themselves. But, how do researchers as parents handle divergent ideals in neoliberal working and private contexts? How do they reconcile production and reproduction as borderless and resistant spheres in the academic working and family life? Our results show that they need to adapt themselves and try to meet and fulfil the requirements of both spheres – as excellent researchers and excellent parents. And this leads to the question of who sets the standards in both areas of practice? Mostly not-employed mothers set the cultural standards for 'good' parenthood and 'good' education, while childless subjects set the standards in the world of work; 'Who nevertheless wants to do both, will be measured by the standards set by those ones that are only into one of the spheres' (König, 2012: 193).

Discussion: A methodological résumé

We find ourselves at a stage in which we have to critically focus on the effectiveness of neoliberal transformations in our social framework. It can be observed that in some areas, neoliberal transformation processes emerge faster and more impressively than in others. One of these faster areas is the academic working system, with recognisable processes of transnationalisation and economisation. Against this background it is exciting and important to ask how the neoliberalisation of universities rearranges spheres such as family, work and parenthood, and how 'academic parents' handle this neoliberalisation of academic and family work. Exploring answers to these questions, the paper brought together two different approaches by triangulating discourse analysis and biographical research *and* by using a gender-sensitive concept of governmentality. The triangulation could be fruitfully exploited methodologically and empirically in order to investigate social images, ideals and their power-related concepts and intersections concerning parenthood and academia as a working place.

But why and how is this triangulation against the background of the used theoretical perspective of governmentality appropriate? Recent deliberations of governmentality studies determine new forms of policies and new forms of subjectivation. According to Foucault, discourses shape the consciousness of subjects and they create new forms of subjectivation. But the methodological question of how to analyse these discursive effects is still unanswered (compare Tuider, 2007). Therefore, linking the proposed methods enables a wider view on neoliberal transformations, subjective modes of action or rather on the 'reality-making (type of) power' (Bührmann and Schneider, 2007: sect. 11).

With our paper we have tried to make clear how both approaches complement efficiently concerning the depth of content and results: on the one hand, the analysed discourse elucidates high attributions of meaning/significance of structural measures (such as childcare facilities), although parents working in academia barely mentioned these structural measures. One could assume mobility and flexibility requirements suggest a great need. On the other hand, the interviews illustrate freely configurable elements of academic work, flexible time management ('comparable with being self-employed' (interview statement)), but also experiences of an 'extreme acceleration' in the academic field in times of neoliberalism. These developments, which make it even more difficult to reconcile family and science, were not contemplated in the discourse in its significance. However, the interviews contain detailed descriptions of the scientists' daily practices, their problem-solving strategies and the mentioned incomprehension of colleagues along persistent traditional pictures of being a scientist. On the discursive level, these family-centred and hetero-normative values are represented within an understanding of childlessness as one of the best prerequisites for an academic career. We can note matches of discursive and biographical analysis, but the interviews especially impressively demonstrate how parents react to the high demands and standards in academia directed at them at the individual level – going beyond the discourse. Conversely, 'the discourse analysis gives indications for the overall context of narratives, which show references and breaks of the individual positioning' (Tuider, 2007: sec. 26) as well as limits and possibilities.

Linking these two methodical approaches the governmental concept can be seen and used as a connecting element or set as a 'hinge' when analysing subjective, resistant and autonomous dimensions of parenthood in science. It also provides initial answers to the question of how attributions of responsibility reproduce old and new opportunities, practices and inequalities. Last but not least, focusing on the active role of subjects/of the interviewees, it becomes obvious that the discourse and the subject are in a mutual constitutional relation.

In short, the interplay of intended and non-intended mechanisms in academia promotes inequality in gender relations when it comes to reconciling work and family life. The reason for inequality is the powerful impact of old and new models and concepts of parenthood and working in academia, combined with the still-common notion (for which/what the gender-sensitive perspective on Foucault's concept of governmentality sensitised) that the division of labour and reproductive work is gendered and contradictory, regardless of the family arrangement.

Declaration of Conflicting Interest

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Notes

1. Which are equipped with a family-friendly university audit (audit familiengerechte Hochschule); two were selected from each Federal State.
2. DUZ – Unabhängige deutsche Universitätszeitschrift; CEWSjournal; Magazin Forschung & Lehre; Hochschulmanagement – Zeitschrift für die Leitung, Entwicklung und Selbstverwaltung von Hochschulen; selection criteria in corpus generation: "work-life-balance", "family" and "parents".
3. One supra-regional daily newspaper (Süddeutsche Zeitung), one weekly newspaper (Die Zeit) and one weekly magazine (Der Spiegel); selection criteria in corpus generation: "science", "academia" and "compatibility".
4. Even highly qualified couples in Germany tend to a traditional division of labour in fields of work, household and care after a child's birth. Rüling (2007) and others called this phenomenon connected

with a child's birth a 'traditionalisation trap'. Young children have been discovered as a crucial factor concerning the constellations of employment and career in academic partnerships.

5. In her research, Regina Becker-Schmidt (2003) analysed the 'double burden' of women factory workers who were responsible for domestic work and for contributing to the income of the family. Becker-Schmidt then developed the concept of the 'double socialization' of women through the (separated and connected) spheres of wage labour and domestic work that come from two different social realms with different logics.

6. In 2006, 75% of the female research fellows and 62% of the female professors in Germany were childless. Female research fellows as well as female professors are more likely to remain without children than their male colleagues; in particular, for professorate the difference is between 62% and 33% (compare Selent al., 2011: 343).

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EERJ

How do you take time? Work–life balance policies versus neoliberal, social and cultural incentive mechanisms in Icelandic higher education

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Abstract

It is suggested that the realization of work–life balance policies at the University of Iceland is compromised by an emphasis on neoliberal notions of growth and performance measurements in the form of new public management strategies. This is sustained by overt and covert incentive mechanisms, which in turn create a range of different gendered implications for academic staff. The results from semi-structured interviews suggest that while this tension field affects all academic staff, it is generally less favourable to women than to men. If women were granted time for the sake of family obligations, they risked a setback in their academic career due to decreased research activity. Women tended to view academic flexibility as an opportunity to engage in domestic responsibilities more so than men; and male interviewees tended to view the prioritization of family as a choice, while women tended to view it as a condition.

Introduction

The new public management tradition, which has its ideological basis in a neoliberal focus on isolated individual emancipation in a free market system, stands in sharp contrast to policies on gender equality which are traditionally built on an understanding of inequality as being rooted in

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larger systems of power. We suspect that when two so vastly different policy-making discourses are supposed to drive forward the development of the modern university, this must not only create tension but also must necessarily favour one over the other due to their mutual incompatibilty. In the Icelandic context we find an example of this seemingly mutually exclusive tension field between the University of Iceland's points-based evaluation system on the one hand, and its work–life balance policies on the other. The points-based evaluation system at the University of Iceland means that researchers are awarded points for their publications according the status and prestige of the journal in which they publish. These points, in turn, are then used to calculate when a researcher deserves promotion or a permanent position.

In this article we want to explore the gendered implications of the processes by which work–life balance policies function under conditions influenced by underlying incentive mechanisms for early-career academics at the University of Iceland. This is a midsized research university, founded in 1911, with a student body of 13,052 (34% men, 66% women) in 2014 and a total of 728 full-time equivalent staff (56% men, 44% women) (University of Iceland, 2015).

The realization of work–life balance policies at the University of Iceland is challenged by an emphasis on neoliberal notions of growth and performance measurements. This process, we would argue, is sustained by what one might call incentive mechanisms. In the context of this article, an incentive mechanism is regarded as a structural contraption that functions parallel to, or lies behind, an official policy or statement as part of an organization's basic structure and creates contradictory yet inevitable outcomes. Incentive mechanisms can be overt and formal and/or based on neoliberal market governance (e.g. a points system), covert and informal (e.g. peer pressure), or based on broader cultural traditions or social practices (e.g. patriarchy). Throughout this paper we will discuss examples showing how some academics are incentivized by neoliberal, social and cultural means to spend less time with their families, to become ideal workers by accepting and participating in the long-hours culture of academia, to constantly publish, and to live up to the gendered expectations of society in their work lives. While all of these mechanisms may be discussed separately, it is important to note that they also intersect. As such, it is not possible, for example, to separate the broader gendered expectations of society from the way in which academic women in particular might find it more difficult to balance family life with the long-hours culture of academia.

While we focus on a single academic institution, we hope that this contribution might inspire broader and more in-depth musings about the role of policy in higher education more generally.

Neoliberalism and greedy institutions

Even though the neoliberalization of higher education is a topic that continues to generate public debate (e.g. Eagleton, 2015; Chomsky, 2014; Fish, 2009), a fairly large body of scholarly literature has long put to rest any doubt about its existence (e.g. Walsh, 2013; Ward, 2012; Ginsberg, 2011; Newfield, 2008; Torres and Schugurensky, 2002). As a political ideology, neoliberalism is popularly defined as 'a philosophy in which the existence and operation of a market are valued in themselves … and where the operation of a market … is seen as an ethic in itself' (Treanor, 2005). Following this logic, higher education is reduced to functioning in terms of economic production, part of which has been the implementation of new public management strategies. Amongst other things, these strategies emphasize performance-based policies, replacing notions of public interest with an emphasis on individual academics as rational self-interested economic agents (Olssen and Peters, 2010). This is part of a broader trend in global economic development towards an emphasis on international reputation and inclusion in formalized ranking systems. As such, following the new neoliberal tradition of encouraging market competitiveness in (former) public service institutions, international universities are now in a constant race to become the next Harvard or be

included in the Times Higher Education Supplement (Feller, 2008), which has led universities to adopt formal and quantifiable performance measurement systems (Deem and Brehony, 2007; Priest et al., 2002; Deem, 2001).

This neoliberalist movement in higher education towards formalized performance-based success criteria has arguably helped turn modern universities into what Coser (1974) termed 'greedy institutions'; that is, institutions which seek to gain the full and undivided attention of their workers by subtly preventing them from fulfilling familial obligations or engaging in social activities outside of their institutional role. Currie et al. (2000) explored the nature of universities as greedy institutions by exposing a top-down masculinist discourse that seeks to normalize high workloads and prime commitment to the university. So powerful and subtle is this discourse that institutions manage to bring about voluntary compliance in its members/workers (De Campo, 2013). Santos and Cabral-Cardosa (2008) argued that a transformation of universities into greedy institutions has taken place across the European continent, leading to intensification of work and – in their local Portuguese context – to the establishment of career programmes premised on men's career paths.

Acker and Armenti (2004) explored this from a feminist perspective, showing that women academics develop a range of coping strategies in order to keep up with institutional demands, many of which include simply falling in line with these demands by working more and sleeping less. As such, the greedy university favours a 'care-less worker', that is, a person with little or no familial obligation, which, in our current social structure, should be taken to mean those who generally are male (Grummell et al., 2009). In contrast, mothers in academia find themselves positioned within the contradictory discourses of the 'good mother' and the 'successful academic' (Raddon, 2001), but even academic non-mothers are influenced by the social ideology of motherhood and are often expected to show extra levels of care or put in extra hours at work because they do not have children (Ramsay and Letherby, 2006).

The University of Iceland has not been immune to this development. In 2006 this particular university set the 'long-term objective of becoming one of the 100 best universities in the world' (University of Iceland, 2006). Given that the University of Iceland is based in a tiny island nation, the idea that it would, in just a few years, be counted among the likes of Harvard and Princeton might seem somewhat far-fetched or, in the words of Ársælsson, perhaps a sign of 'delusions of grandeur' (Ársælsson, 2011: 9). Nevertheless, the action plan for reaching this seemingly unattainable goal was set in motion. The process included, among other things, a plan to 'Increase research activity and quality of research [and] increase [the] number of papers published in respected international peer-reviewed journals … by 100% by the year-end 2011' (University of Iceland, 2006). When the policy was due for revision, in 2011, much of this rhetoric was toned down, perhaps partly due to widespread disbelief among academic staff about the prospects of the policy succeeding (Ársælsson, 2011). Nevertheless, the university continued to outline 'specific goals on research and innovation' (University of Iceland, 2006), which meant creating an assessment system for research in order to give greater weight to prestigious publications, adding to the already complicated *Evaluation System for Public Universities* (University of Iceland, 2013). Without going into very intricate details, this new system of assessment placed most of its emphasis on research, which meant that an employee's chances of promotion or increased salary now relied almost entirely on them being able to produce large quantities of research suitable for international peer-reviewed journals.

Curiously, at the same time as the University of Iceland operates according to ambitious new public management strategies, part of its narrative also relies on an image of Iceland itself as a gender equality utopia, perhaps in no small part thanks to Iceland's continuous Number 1 ranking on the Global Gender Gap Index (World Economic Forum, 2015). While it is certain that Iceland is no feminist paradise (Rudólfsdóttir, 2014), it is perhaps not surprising that the University of Iceland, as an international research university, would attempt to live up to this ambitious standard,

especially so given Iceland's sensational reputation in international media as the world's foremost feminist stronghold (e.g. Iceland Monitor, 2015; Noman, 2015; O'Leary, 2014; Cochrane, 2011; Bindel, 2010). A cursory glance at its official policy does indeed reveal a university that 'always wants to be at the forefront of gender equality' (University of Iceland, 2011: 5). This is reflected in the university's policies on work–life balance. While the university does not have a policy with the words 'work–life balance' in it per se, policies relating to the subject are nonetheless reflective of the university's commitment to gender equality issues and can be found in the staff handbook, its Equal Rights Policy (University of Iceland, 2014) and in its Human Resource Policy (University of Iceland, 2004).

Early-career academics

We were interested in exploring what the structural adherence to new public management principles does to the realization of these work–life balance policies for early-career academics. We suspected that this group might be particularly vulnerable to the demanding inner structure of the greedy institution that is the modern university because of the added burden of, for example, employment instability in this period (Fusulier et al., 2013). Among other examples, Fox and Stephan (2001) showed that both academic field and gender were strongly tied to the ways in which women and men in STEM fields predicted their career prospects vis-à-vis the reality of these careers. Moguérou (2004) has shown that among French PhD graduates married women are less likely to take up a postdoctoral position than men; and, in a US context, Wolfinger et al. (2009) showed that women PhD graduates were disproportionately likely to accept badly paid adjunct positions than were men. We hope to contribute to this growing body of literature by providing an insight into how early-career academics tackle work–life balance issues in particular.

Conceptualizing work–life balance

Work–life balance is itself a contested term. It has been suggested that it hints at a relationship between life and work that assumes the two aspects not to be integral to one another, and that the term places the responsibility for social change on individuals rather than on structural inequalities (Burke, 2004). While this might be true, and while alternative terms such as 'work–personal life integration' (Lewis, 2003) or 'work–life harmony' (McMillan, 2011) might more accurately reflect the conceptualization to which we adhere in our context, the fact of the matter is that no new alternative terminology has managed to gain widespread popularity in the literature. Therefore, as did Gregory and Milner (2011), we choose to retain 'the original, long-standing, and easily-understood term' (Gregory and Miller, 2011: 2) and provide our own conceptualization in the following.

The period of the last 20 years has seen an explosion of research into work–life balance issues, including a substantial array of different conceptualizations (Marks and MacDermid, 1996; Clark, 2000; Frone, 2003; Greenhaus et al., 2003; Grzywacz and Carlson, 2007; Kalliath and Brough, 2008; Brough and O'Driscoll, 2010). While all of these conceptualizations have each been the basis of valuable insight into work–life balance issues, they also have one other thing in common – that they are largely gender-blind. Indeed, as Emslie and Hunt (2009) correctly pointed out, 'Many contemporary studies of work and home life either ignore gender or take it for granted' (Emslie and Hunt, 2009, 152).

In fact, one might go so far as to say that these early concepts of work–life balance have neoliberal underpinnings, in that they respect individual priorities for spending more or less time at home or at work, thus making the individual solely responsible for their work–life situation rather than the existence of systemic and structural inequalities. We define work–life balance as those instances

when organizational structures facilitate substantial time for involvement both at work and at home in a way that seeks to challenge existing gendered hierarchies in the organization and society more broadly. In this way we situate our own conceptualization of work–life balance within the framework of a larger paradigm shift in the literature that Moen (2015) terms the 'institutional/ organizational turn' (e.g. Hobson, 2014; Milkman and Appelbaum, 2013; Williams and Dempsey, 2014) in which work–life balance issues are seen as 'lodged not in individuals but rather in different … organizational policies and practices' (Moen, 2015: 177). This opens up the possibility of a gendered analysis of contradictions between work–life balance policies and organizational practice at the University of Iceland.

Work–life balance specifically in academia is a notion that has been linked to occupational stress among UK academics (Tytherleigh et al., 2005; Kinman and Jones (2008), and something which in South Africa 'contribute[s] significantly to [the] ill health of academics' (Barkhuizen and Rothmann, 2008: 321). This has also been confirmed in Icelandic and Australian contexts, where work–life balance is further complicated by the reliance on e-technologies in academia (Heijstra and Rafnsdóttir, 2010; Currie and Eveline, 2011). While Doherty (2006) reported some success with an action research approach to improve work–life balance conditions for UK academics by involving an 'organisation's members in the various stages of problem diagnosis, planning and taking action' (Doherty, 2006: 253), it was ultimately concluded that 'a sustainable WLB [work–life balance] is hard to achieve [because] academics experience a long hours culture' (Doherty, 2006: 254). While there might be many explanations as to why the culture of stress associated with extensive workloads continues to persist in academia, we would like to suggest that a solution is to be found not only in the implementation of work–life balance policy, but also in a critical inclination towards the incentive mechanisms that underpin higher education in general.

The function of policy

While it would be fairly simple to measure work–life balance policies at the University of Iceland against the reality of new public management programmes, this, however, is not how policy-making works. While a policy might be defined as a deliberate set of basic values, principles and guidelines containing detail to a greater or lesser extent, formulated by the governing body of an organization, a policy hardly ever reflects the current reality of the organization; neither is it supposed to fulfil this role. Rather, it is useful to think of a policy as a plan or a vision for what an organization aspires to be. In this way, policies and policy-making are arguably important parts of any organization's self-envisioning process. But even though perfect implementation is unattainable (Hogwood and Gunn, 1997), a good policy should, in the hands of the right people, at least stand a fighting chance of being implemented to a somewhat satisfactory degree. It is, however, no secret that some policies might, for one reason or the other, be 'ill adapted to the real world' (Hill, 1997: 3). A policy may fail to engage people's moral purpose, their sense of capacity building and understanding of the change process (Fullan, 2006), or it may fall victim to a range of different resistance strategies (Malen, 2006), including those difficult situations when administrators and stakeholders 'view [a policy] program, or their specific contributions to it, as contrary to their interests' (Weimer and Vining, 1992: 329) or when local line managers go against policy directives in an effort to secure desired knowledge production outcomes.

Methodology

In order to explore the relationship between policy and practice at the University of Iceland, we relied upon selected university polices in addition to the outcomes of semi-structured interviews

collected for the GARCIA project, a project supported by the European Union 7th Framework Programme which plans to map and analyse the gender dimension at different organizational levels in seven European institutions of higher education (see http://garciaproject.eu/ for details of the project).

Data collection

Our research focuses on an analysis of policies related to work–life balance at the University of Iceland, and the staff handbook. While official policies were found via the university website, the staff handbook was in our physical possession. We also collected qualitative data using an inter-viewing process with 20 current and 12 former academic employees at the university, with a focus on early-career academics. The first listed author (TB Smidt) carried out the interviews and will be referred to as the 'researcher' hereafter. The decision to interview both current and former employ-ees was motivated by the prospect of juxtaposing those 'outside the system' with those still work-ing within it.

Participants representing the group of current academic employees were found via a search on the University of Iceland website. E-mail invitations were sent to potential participants and interviews were conducted with those who agreed to participate. Because the University of Iceland does not keep records of employee departures, former academic employees were found via word of mouth; they received the same e-mail as the first group of participants. Semi-structured interviews based on a structured interview guide were carried out with all participants. The guide posed questions relating to individual trajectory, organization of work, wellbeing, work–life balance, career development and perspectives on the future. Interviews were mainly conducted in English: four were conducted in Icelandic and these have been translated into English for the purpose of this present article. Of the 20 current academic employees, 11 were from the School of Social Sciences (eight women, three men) and nine were from the School of Engineering and Natural Sciences (five women, four men). Of the 12 former academic employees, five were employed at the School of Social Sciences (two women, three men), and seven were from the School of Engineering and Natural Sciences (five women, two men). Participants were not sampled particularly because they had families; but, interestingly, it was the case that 27 of 32 participants were parents. Of these, 16 were women and 11 were men. In 2014 in Iceland, the average birth rate was 79 per 1000 population and the average age for first-time par-ents in 2015 was 27 for women and 30 for men (Statistics Iceland, 2014).

Data analysis

Official university policies as well as the staff handbook were subjected to a content analysis so that all categories relating to work–life balance were mapped out. These were then subjected to a discourse analysis aimed at distilling their content to five main principles that were then measured against our interview data. All our interviews were transcribed and uploaded to Atlas.ti coding software. Our first cycle of coding was open-ended and consisted of encoding the most prevalent categories, in order to gain the necessary overview that would lead to further questions about the data (Coffey and Atkinson, 1996). After the first cycle of coding, a pattern began to emerge, and so our process of axial coding (the second cycle) consisted of connecting categories according to conditions, context and consequences in an effort to gain an in-depth understanding. Finally, we selected core categories and systematically compared and related them to one another in order to confirm or disconfirm different categorical relationships (Strauss and Corbin, 1990; Saldana, 2009). Given that the University of Iceland is a very tightly woven research community, we have made strenuous efforts to ensure the anonymity of participants; and, accordingly, throughout our

analysis of interviews participants are referred to by pseudonym, gender and broad academic affiliation only. In those cases when a string of experiences elaborated by one participant might have revealed their identity, a different pseudonym was used.

Results

The UI staff handbook mentions the possibility for employees (not just academics) to work flexible hours, insofar as they deliver a 40-hour working week, and that coffee (etc) breaks (set at 15–20 minutes per day) can be skipped in favour of fulfilling these working hours within a shorter time period. The University of Iceland Human Resource Policy (University of Iceland, 2004) has a clause entitled 'Working hours and family responsibilities' in which it is emphasized that the university is strongly opposed to the notion of excessive workloads, and wants to ensure that employees have enough time to rest. We have distilled below all relevant information on work–life balance from the staff handbook and the human resource policy into five main principles.

1. The university endeavours to provide the conditions employees need to coordinate their professional and familial obligations.
2. Employees shall be offered the chance of a temporary time commitment reduction if familial obligation demands it.
3. This shall not affect their professional advancement.
4. Employees shall be offered flexible working hours if familial obligation demands it.
5. The university encourages fathers to make use of the opportunities to coordinate professional and familial obligation.

In what follows we will begin our analysis of the gendered implications that follow the general non-implementation of work–life balance policy arising as a result of neoliberal incentive mechanisms. We will do so while continuously referring back to these five principles.

The ideal academic and gendered guilt

The first principle might be interpreted as the university's overall vision: it wishes to establish conditions, or an atmosphere, which will help employees obtain a satisfactory work–life balance. If we juxtapose this sentiment with our interviewee experiences, the policy is already at odds with the university's fundamental structure, because the atmosphere at the university, as described by research participants, is a far cry from that which it seeks to promote. For example, on a day-to-day basis, Baldur, a former SSH adjunct, stated that, 'you always sort of get the nagging feeling that if you're taking time with your family, that you are neglecting work'. Baldur's experience indicates a work environment in which employees are made to feel guilty for being with their families rather than a 'work environment, which enables [you] to coordinate … work with family life' (University of Iceland, 2014). Nanna, a STEM post-doctoral member of staff, pointed out how implausible it was to live up to the – now normalized – academic working hours:

> I have a [small child] and before I had him I was working very long hours and every weekend … But now I try to be here at around 8 [am] and pick him up at — around 3 or 3.30 [pm]… so of course we can't work as much.

Nanna was accustomed to putting in a much more extensive workload and thus likely to produce more research, increasing the likelihood of advancing her career. However, with the arrival of

children, this became more difficult to achieve. Magnús, another STEM post-doc, emphasized further the impact family responsibilities have on the academic's ability to deliver a long workday:

> If you have a family here, then you're not going to be working 10 hour days, or you're less likely to, but if you have nothing in particular … you might as well stay here a little longer and you might as well come here on the weekends rather than staying home and do nothing.

Certainly, it is unfair to assume, as Magnús does, that academics without children stay home and do nothing. However, the underlying assumption he makes here is that people with families are not able to fulfil the workload expected of an academic. Moreover, in reflecting on pressure from work, Ósk – another STEM post-doc – pointed out that,

> My workday is from 8 to 5. I work 100% those 9 hours per day. [Eyes wide open, visibly angry] There is not room for 100% more. Then I don't have a life! Is that the kind of person you want to hire?

Tragically, the answer to Ósk's question might be 'yes'. There seems to be an expectation that an academic without family puts in a significant amount of work that goes beyond the specifications of a standard full-time contract. As such, workplaces may be constructed in such a way as to favour engagement in paid work as the primary responsibility of ideal workers (Kelly et al., 2010) who have to show engagement and devotion to their jobs (Blair-Loy and Wharton, 2002). While ideal workers are not necessarily male and do not necessarily embody a masculine ethos (Tienari et al., 2002), they inhabit traits of commitment and presence at the job rather than at home with their families (Cooper, 2000; Gambles et al., 2006). The same appears to be true for how priorities of work–life balance are constructed at the University of Iceland, where one informal incentive mechanism is the likelihood of faster academic advancement and thus more prestige and higher salary if one does not have a family. In this way, the notion of the ideal academic, which arguably can be said to enhance the effect of neoliberalization in higher education, stands in stark contrast to the very idea of having a work–life balance policy in the first place.

It is important to note that academics experience incentive mechanisms differently. For example, with regard to spending less time with one's family, women appeared to be visibly more affected than men, in that women experienced a clear double bind in which incentive mechanisms pulled at them both from home and from work.

When Baldur explained the 'nagging feeling' he gets when spending time with his family (see above), he is expressing the sense of guilt that sometimes follows the notion of the ideal academic, someone constantly working towards meeting deadlines, living up to teaching responsibilities and producing a large quantity of research. Among our interviewees, however, Baldur was an exception. When notions of guilt in relation to balancing work and family life emerged as a theme in our interviews, this was experienced mostly by academic women.

Speaking of the pressure to be constantly publishing, Bára, an SSH assistant professor, expressed it thus: 'If you are constantly working, how do you take care of yourself and your family? How do you take time? … I find it difficult always feeling guilty because I could always do more'. In Bára's case, guilt in relation to one's family arose from pressure from work; but this guilt may also be linked directly to lack of family contact, as in the case of Aðalbjörg, an SSH assistant professor, who said that even though she had 'very good support from home', she still had her 'own conscience to deal with in terms of not spending time with my children, but you know … you can always do better and [I have] to stop beating myself up for not being everywhere for everybody all

the time'. Whereas Bára expressed her guilt as stemming from work ('you can always do more research'), Aðalbjörg's guilt stemmed from her own troubled conscience in relation to her family ('you can always do better'). This conversation also brought into question what it means to have adequate support from home in relation to work.

While it is entirely possible to have a family that backs you up in your attempts to advance your career, as was the case with Aðalbjörg, this does not soothe your own troubled conscience. In this way, incentive mechanisms are also embodied in broader cultural/social expectations about who we are and what we ought to do. In relation to work–life balance, these expectations are gendered. In fact, despite substantial gains in the realm of gender equality, it would seem that Walby's statement that 'a woman today considering employment decisions will be constrained by her domestic circumstances' (Walby, 1990: 56) remains largely true. In addition, as others have shown, guilt is linked to perceptions of feminine gender roles (Benetti-McQuoid and Bursik, 2005), especially in the interplay between work and family, where it becomes an integral feature of everyday life (Elvin-Nowak, 1999). Steinunn, an SSH adjunct, confirmed this notion when she explained that young women in her department 'have this bad conscience … The guilt is always present … [they] have to be at work and have a career, but to do that [they] need to give up something at home and then the guilt becomes more'.

Moreover, Dagbjört, an SSH assistant professor said that while it '…doesn't reflect really well on me, I didn't even take maternity leave because of work and because of financial circumstances … I've gotten a lot of comments from society – people really feel that women should take maternity leave.' Seen in context, this is yet another example of how guilt is gendered in relation to work–life balance, and how this guilt is created by cultural/social incentive mechanisms. In this case, even though Dagbjört ended up choosing not to take maternity leave, there was clear social pressure on her to do so; that is, despite the prospect of not having to deal with how society all too often judges those women who do not choose family over everything else, and in choosing to go against the grain, she received 'a lot of comments from society'.

No considerations

We now turn to the second principle regarding the ability of employees to have the opportunity of a temporary reduction in work-time commitment if familial obligations demanded it. Nanna recalls a conflict she had with a local line manager when she was pregnant:

> I was having a lot of work load and was not coping, and I kind of broke down and I was saying that I was having too much work and it was not taken seriously I think, but then soon after that I got health problems and I think then he realized the seriousness of this and he's been very nice after that.

It is very striking to observe how, when a pregnant woman had a breakdown, the default reaction was to not take her seriously until she started experiencing health problems. Insofar as we consider a pregnancy part of familial obligation, it is clear that in this case Nanna was not able to obtain a reduction in work-time commitment, and so her personal experience directly contradicts the second principle. Again, it is important to emphasize that a policy is a vision or a guiding light, not a reassurance of how day-to-day reality is supposed to play out. To say that Nanna's experience contradicts official policy is not to say that the policy is inadequate. However, there was a reason for the organization to keep Nanna at work – so that she could continue to turn out research – and there was informal pressure on Nanna to emulate the ideal academic as described above. Ultimately, Nanna took a break from work, acting on the promise of official policy because her superior came to his senses. Dísa was not so lucky:

The university had no mechanism to say 'OK, you gotta look after yourself a bit now'. It is not enough that your son is in the hospital, no, I got whipped into full teaching responsibilities. Total lack of sleep and just no considerations. This is a workplace that does not treat its employees decently. Everyone burns out one time or another, because everyone has some kind of irregularities in life.

The university did not have the necessary 'mechanism' to let Dísa go and take care of her son, who was sick and in hospital. One would think that a work–life balance policy would constitute such a mechanism. However, Dísa was new at the job and, like so many other early-career academics, her teaching responsibilities were extensive, and in her absence there might have been no one to take over her duties. This is another example in which policy is rendered futile by an already-existing mechanism.

Career advancement

The policy principle which promises the possibility of a reduction in work-time commitment is followed by an interesting premise, namely the third principle which states that such a time commitment reduction should not affect career advancement. Ragga, an SSH assistant professor was in a situation similar to that of Nanna and Dísa. However, in Ragga's case it was not the workplace that denied her a time commitment reduction, but herself.

[During] pregnancy, I was – my health wasn't that good. Or I was able to work, but I spent [sic] all my focus on teaching, because teaching is what can't wait. So I'd come here after teaching and I'd have a mattress here in the office, I would just lie on the floor and sleep, I was completely, like, my energy levels were like this much [very little], so I had a pillow and a camping mattress and would just take a half hour nap, recuperate and go back to work.

Ragga's example is interesting because it illustrates that the informal pressure to live up to work responsibilities can be so strong that employees deny themselves basic rights (the policy) – as was the case with Aðalbjörg, who chose not to take maternity leave, because of workload. Moreover, Ragga was all too aware of what maternity leave was going to do to her career:

So it was very much like – went on maternity leave and ugh, then pregnant again and another maternity leave, so also getting my research off the ground – it's here that I wanna be [with my research productivity], its – so I worry a little bit that I'm now stuck with few [research] points – and if you're stuck with few points its harder to get the grants, and I do feel the system does not take that sufficiently into account – it worries me quite a bit.

Raggas's experience exemplifies our point in a nutshell: there is an official work–life balance policy which states that employees have the right to maternity and paternity leave, a reduction in work-time commitment, or flexible working hours, without any of these factors damaging their careers; and while the system does take parental leave into consideration, by lowering the annual amount of points that an employee has to acquire, parental leave might still result in a career setback because of decreased research activity (Heijstra et al., 2015). Thus the formal evaluation system (incentive mechanism) will, in effect, punish anyone who claims any of the rights spelled out in the official work–life balance policy. Consequently, because the official policy does not address the basic fundamental fabric of the system, it can sound both lofty and ambitious, while the fact of the matter is that employees are unlikely to invoke it because there will be repercussions.

Flexibility to do what?

Flexibility is the focus of the fourth principle. It is generally considered one of the perks of academia because it supposedly helps employees to harmonize their work and family lives (e.g. Ward and Wolf-Wendell, 2012), and many of our participants did identify it as one of the more positive features of their job. For example, Lárus – a STEM assistant professor – explained that it is 'the good thing about academia, you have this flexibility, there's no [time clock]'. In this way, flexibility was greatly appreciated by interviewees in general, and the positive aspects and possibilities it brings about should not be ignored. However, there was pattern in our interviews as to how flexibility was appreciated, which was not straightforwardly positive. For Fjóla, flexibility was a means to an end:

> I try to start my day early, around 7 or 8, try to get here, then I can leave earlier because my [child] is at home, so they're really flexible here, sometimes if she is sick or something I can work from home and that's great, you know, so – this semester, due to a lot of people being off on research sabbatical, I've taken on extra teaching, and that's been really, really difficult with planning and making sure everything is done, so pretty much all I've done is teach this semester.

Another example is Aðalbjörg who was also accustomed to using flexibility to catch up with family responsibilities:

> It's one of the perks of academia, that you are not constrained by your chair, you do not have to sit in your chair between 9 and 5 every day, so – if I have some duties towards my [children], or – my mother who is growing older, I can obviously go and nobody cares.

In these examples, flexibility becomes a means of simply attending to other responsibilities in life. More specifically, it becomes a means of living up to cultural/social incentive mechanisms in the form of gendered expectations to domestic labour. Other research has indicated that flexibility in academia is gendered, in that women disproportionately end up using their flexibility in caring for family and carrying out domestic work (Probert, 2004). In researching the structuring of time among Icelandic academics specifically, Rafnsdóttir and Heijstra (2011) have also shown that, when it comes to making use of flexibility, it is predominantly women who 'seem to be stuck with the responsibility of domestic and caring issues' (Rafnsdóttir and Heijstra, 2011: 283). The same was true among our research participants. As such, while male participants did mention that they used 'flexibility to spend more time with the family' – as, for example, did Lárus – most often it was mentioned fleetingly and with the underlying sense that flexibility for family constituted a kind of leisure activity rather than a responsibility. As such, Andri, a STEM assistant professor, believed flexibility to be 'fun' because you have the freedom to 'do what you want'. In contrast, Magnús believed that flexibility might be used for working even more:

> People will want to produce those results and not worry about [being] confined by an eight-hour workday. So I think generally people will be working more than this. You know, you have a flexible work time, there's no clock you have to punch when you go home, and I think that results in, you know, more than an eight-hour workday

Baldur echoed this sentiment:

> It's flexible so you can find ways to work more. You can take your laptop home and work in the evening or into the night or – I mean that's not really flexibility. If you have a low output one year it could damage your prospects in the long run unless you've been extremely productive in the years before that.

Note in particular the fact that Baldur mentions here that if you make use of academic flexibility, it can decrease your research output and 'damage your prospects in the long run'. This is another example of how a formal incentive mechanism works contrary to the policy on flexibility. Other women interviewees used flexibility to recuperate, but not in the way one might think. Aðalbjörg expressed it thus:

> Because I can allocate time in my own fashion, even when I have to work 45–55 hours a week or more, it doesn't matter because I feel that when I need the rest, I can take the rest, you know, I have a chair here and a blanket [points to a comfy looking chair and blanket], so I can just nap if I need to.

This is similar to Ragga's experience that we touched on in the previous section in which she, while pregnant, would roll out a 'camping mattress … take a half hour nap, recuperate and go back to work'. In both of these examples, recuperation becomes instrumentalized. Its function is not to enhance life quality or even improve work–life balance. As in the examples of Baldur and Magnús, it becomes a way for the academic to work even harder.

While almost all interview participants (except Baldur) spoke favourably about the possibility of having flexible working hours, women academics tended towards praising flexibility for what it allowed them to accomplish in terms of domestic labour and caregiving, while men spoke of it in terms of autonomy at work and the possibility for working even more. Looking at this through the lens of incentive mechanisms, it is clear that Baldur, at least, warned against using flexibility because of the formal evaluation system. When it came to women interviewees, broader cultural/social incentive mechanisms prevented some of them from using flexibility for leisure or a sense of freedom or autonomy.

Family: choice and condition

The fifth and final principle of the University of Iceland work–life balance policy is not so much a statement of the right of employees but, rather, more of an encouragement for fathers in particular to make use of the other principles. One could argue that this is a way for the policy to counter some of the deeper-rooted cultural/social incentive mechanisms that still primarily punish mothers for not being there for the family while generally encouraging men to pursue their careers by embracing the ideal worker construct. However, this is not at all to say that male academics tended towards not wanting to spend time with their families. During our interviews, male academics spoke very highly of their families and occasionally mentioned the importance of spending time at home, trying not to work too much, or even quitting their jobs in academia to be there for their children. This is a positive development.

However, as we saw in the previous section, women and men had very different experiences in relation to flexibility vis-à-vis family responsibilities, even though both men and women shared the feeling of never being off work. As Andri put it, 'it's too easy to take the job [home with you]'. Whereas this constant pressure of work was a very common theme for both women and men, only women described the pressure of home life in the same way as they would describe working circumstances. As Aðalbjörg said, 'You can always do better and [I have to] stop beating myself up for not being everywhere for everybody all the time'. Not only does she take it for granted that she must find a way to tackle her work–life balance, but also she experiences a lot of internalized expectations to be both a good mother/wife and a good academic. Notice that her being there for her family is not constructed as a choice she has made for herself, but as an inevitable consequence of starting a family in the first place. In this way, as is evident from the examples in the previous section, women interviewees tended to speak of hardships and challenges when it came to

compromising work and family life as an unquestionable condition. As Bára said, 'It becomes this conflict between the academic way of living and family life … If you are constantly working, how do you take care of yourself and your family? How do you take time?'.

Male interviewees, in contrast, tended to talk about the difficulties of juggling work and home life in terms of concern, priorities and choices. For example, Ingi, an SSH assistant professor, expressed concern by saying: 'I wouldn't be surprised if my kid, at 17, asked to reflect upon her childhood […] would probably remember me working a lot'. Notice that while he expresses concern, he does not take it for granted that he ought to be home more. During the interview he also expressed the clear need to perform at work, but never mentioned the same pressure to perform at home.

Ragnar expressed concerns that were more priority-related when saying, 'I came to that point that I wanted some other qualities in life – living with my family … It was a tough decision because I have ambitions for the academic development of [my academic field]'. Note especially the fact that while this former employee prioritized family over work, he clearly experienced that *he had a choice* as he executed a 'tough decision'. Magnús echoes this when he says, 'If I would have stayed here [during evenings and weekends] and been super driven and not … be with my family … I probably could have advanced faster'. Taken together, when faced with a lack of time to perform all of one's roles in life, there might plausibly be a tendency among men to prioritize, i.e. *choose* either family or work and accept the consequences of prioritizing one over the other, but not to think of family responsibilities as a *condition*, as do the women. This might also be connected more broadly to men's position in the labour market, where they experience a level of possibilities and choices that women do not (Pétursdóttir, 2009).

The choice versus condition construct is strongly related to broader, gendered cultural/social incentive mechanisms in which women are still perceived as having the main responsibility for the well-being of the family. Another previous example of this came from Dagbjört, who, in a manner of speaking, was one of the exceptions to confirm the rule when she 'didn't even take maternity leave'. The fact that she had concerns about even saying this out loud on tape (rest assured, we have express permission to use her testimony) – that she made a *choice* no different from that which men often make – shows the extent to which gendered incentive mechanisms for women to be at the centre of the family, and their taken-for-granted role as mothers, have been internalized in the minds of some. As mentioned, when the fifth principle encourages fathers especially to make use of work–life balance policies, it recognizes the unfortunate social trend for fathers to be less likely to do so than mothers. However, as with the rest of the University of Iceland's work–life balance policy, this remains an encouragement and fails to establish any real incentives for fathers to do so.

Conclusion

Policy-making is generally considered a useful tool for bringing about positive change in the academy and, in the right hands, simple words on paper can indeed make a difference. However, what we have aimed to show from our local context is that the neoliberalization of higher education and the resulting emphasis on new public management strategies (perhaps in the western hemisphere more broadly) is not just an unfortunate reality that might halt the realization of policies aimed at social change, or, as in this case, work–life balance policies. Instead, as the results of our qualitative analysis seem to indicate, overt, covert and cultural/social incentive mechanisms derived from a neoliberal framework are all in place effectively to stop work–life balance polices from being adequately implemented altogether.

We have shown how the very premise of the university's work–life balance policy is compromised by the systemic construction of the tireless ideal academic with endless energy and no

family. While all participants decried these circumstances, male participants appeared to have an easier time living up to these expectations, which created an atmosphere of guilt in relation to work–life balance to which women appeared to be especially susceptible, arguably due to broader gendered social processes. The incompatibility between the workloads and pressure to produce created by the university's points-based research evaluation system as well as other informal pressures was a consistent theme throughout. As such, we have shown examples of when the needs of the institution for producing more and living up to its own promises of excellence and performance output were prioritized over the dire familial needs of employees. In agreement with previous research, we have also shown that academic flexibility is not just an option that (predominantly) women use for the sake of their families; it also becomes a way for them to amend broader social/ cultural incentive mechanisms of gendered guilt connected to domestic responsibilities and the role of caregiver. In this way the different incentive mechanisms within the neoliberal university intersect to create an intrinsic web of precarious conditions for modern academics. We have also suggested that the professional advancement of employees might be compromised by invoking the principles of work–life balance policies and that, while these policies might encourage fathers to make better use of them, the policy ultimately fails to address the fundamental issues that are preventing it from reaching its full potential, thus doing no more than merely scratching the surface of deeply rooted gendered, neoliberal incentive mechanisms.

It is important, however, to note that the neoliberal university did not create the notion of the ideal worker or the gendered expectations heaped upon academic women. While these were all known concepts before the dawn of the neoliberal project, they do seem to fit somewhat perfectly into the neoliberal melting pot, where they appear to complement and reinforce one another into a modern academic ethos in which the notion of the ideal worker is sustained by new public management strategies which, in turn, reinforces the expectation to participate in a long-hours culture where women end up missing out because of ancient – and outdated – patriarchal ideals. This means that those who wish to effect change have not only to battle internal bureaucracies and policies in academia, but also have to face the more subtle pressures of those taken-for-granted gendered structures of society itself. However, this is not to say that there are no parameters for action. We suspect that a key plan for action will include the continued insistence that change is urgent and necessary combined with on-going research that may identify beyond reasonable doubt the mechanisms working against women .

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EERJ

Being Polish scientists and women – between glorious past and difficult present: The 'reverse dynamic of equality construction'

SAGE

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Abstract
This paper focuses on the dynamics that animate the situation of women inside academia and the social world of science. Based on a long-term ethnographic study we chose specific cases (scientists educated in Poland) to illustrate the complexity of the career-making process in the 21st century. In this country, in a social and professional environment that has belonged to the European Union for 12 years, we observed several particularities. In order to demonstrate the process of 'reverse dynamic of equality construction' we adapted a *longue durée* perspective. Our article shows how so-called 'democratization' dynamics (after the political changes of 1989) influenced the professional trajectories of women in Poland. The data suggest a progressive deterioration of the situation for Polish female scientists – a process that is ignored by the majority of Polish scholars.

Keywords
Careers of scientists, private–professional life balance, women equality, mobility of scientists, hidden careers, vampirization

"Have no fear of perfection; you'll never reach it."

Marie Skłodowska-Curie

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Introduction

In 1976, Pierre Bourdieu still used the expression 'man of science' in his theory of the scientific field (Bourdieu, 1976). At the same time, in Poland, for almost a century, the iconic scientist has remained feminine: Marie Skłodowska-Curie. She was the first Pole[1] to win a Nobel Prize in science. She has been a model to follow for many generations of Polish students throughout their entire education process, from primary school onwards. Many students around the world, especially women, have decided to become scientists after reading the biography written by her second daughter, Ève Curie.[2] In Poland, Skłodowska-Curie has been a vital part of general school education from the very beginning. She was one of the principal personages employed in the construction of the Polish national identity in the 20th century. Skłodowska-Curie has been a national hero since the first years of Poland's independence (1918) – not as the spouse of a famous male scientist, but as a strong woman, a prominent scientist and a political figure in her own right. She contributed to the creation of the first cancer research institute in Poland (1932) and brought to her country of origin the knowledge, the instruments and the money necessary for conducting advanced research. The fact that Skłodowska-Curie was an important figure of patriotic education and a national icon is not surprising in the light of the history of the country, which had been under occupation for over 100 years with limited freedom of use of the Polish language and practising of the national culture.

Women professionals (physicians, scientists, specialists in social sciences and humanities) were sought after in the newly recreated country. As a lot of men had fallen victims of the war or were simply missing, equality of the sexes was the *sine qua non* to build a modern state on the ruins (this equality strategy is typical of all liberation movements; Walzer, 2015). Polish women obtained the right to vote in 1918, and a year later the first women were elected to the parliament.[3] In the same period, the educational system of the new country adopted new pedagogy strategies (mixed classes, active methods, artistic education, a child considered as a person, etc.; Osiński, 2007).

This wind of equality was perceptible in various areas of professional activity. In Lviv University, one of the best Polish Higher Education institutions before World War Two (WW2), in the academic year 1934/35 women comprised almost 30% of the total number of students (15% at the Law and Medicine faculties, 45% at the Mathematical-physical faculty and 65% at the Humanistic faculty).[4] These data are also supported by historical material (books, biographies of Polish scientists) – we note an important presence of women crystallographers or microbiologists (Allen, 2014; Hnatiuk, 2015; Kryński, 1997; Wójcik, 2015).[5] Before WW2, women in Poland had much easier access to professional positions than those in many other European countries (on the condition of being a Catholic and not originating from an 'ethnic minority'; Aleksiun, 2016[6]). For example, married women could work with no need for their husbands' consent (whereas in France such consent was required up to the 1980s!). Of course, there were still many obstacles for women in science (Szwarc and Żarnowska, 2000; see for example the case of Zofia Daszyńska-Golińska), but the overall picture was rather promising compared with the academic systems in other countries at the time.

Considering these dynamics, we might expect that at the end of the 20th century and the beginning of the 21st century there should be a proportional balance (specific for each discipline and speciality) between males' and females' careers. Indeed, official statistics show that this is actually the case for students and PhD students (similarly to other EU countries). Yet, to be exact, the number of female students surpasses the number of male students (58% in 2014; Central Statistical Office, 2015). Both tendencies – a substantial increase in the overall number and a progressive feminization – seem to be relevant to PhD students at the University of Warsaw (the proportion of female PhD students went up from 54% in 2005 to 59% in 2014[7]).

At the same time, however, in 2015, in the prestigious Polish Academy of Science, among the 310 honorary members (the membership is attributed through a system of insider elections and co-optations) there are only six women (less than 2%). Even though such a phenomenon is present also in other European countries, the Polish case is, in fact, special, because of social, economic, structural and political aspects: (1) young researchers' extremely low salaries (in today's Poland, a post-doc's monthly salary amounts to 700 euros – without real social security plans, fringe benefits etc.); (2) the precarious employment situation (as it is almost impossible to obtain a long-term contract); (3) discrimination regarding working conditions and salary level (Polish scientists even in EU projects, such as H2020, earn much less than their occidental colleagues with the same tasks of work); (4) extreme disproportion between the cost of living and income (Warsaw or other Polish big cities that host the institutions of research are more expensive than cities in Portugal, some cities in Italy, Spain and even, for example, Berlin); (5) the lack of State's financial support for families with modest incomes (Polish scientists with families receive no financial support comparable to that in Scandinavia or France); (6) the State's childcare system being progressively devastated for over 20 years (now, only a private system is available, with pre-schools being too few and unaffordable (monthly fees equal to a post-doc's salary); (7) the longest career plan for academics (the average age of obtaining full professorship is 57, and only 16% of teaching staff have a chance of reaching that stage; moreover, the acceptance of the promotion – proposed by the professional commission – depends on the President of Poland); (8) a significant decrease of academic freedom due to the political situation (especially in social sciences and some sensitive areas of study); (9) poor intergenerational understanding (scientists of the older generation show little interest in the situation of their younger colleagues with children); (10) a dramatic limitation of women's rights (EU-wise, abortion rights and pre-natal care rights are the worst in Poland at the moment). To sum up, in the larger frame of liberal changes which can be seen in several European countries, the Polish case is extreme in terms of the difficult situation of female scientists, both because they are researchers and because they are women. The most (sociologically) poignant point is that concerning the dynamics of the changes: in today's Poland, we are observing a process opposite to the one which occurred in the first part of the 20th century; instead of gender equality improvement, there is now a growing discrimination within the aforementioned dimensions. This explains our interest in a large historical perspective.

Several questions arise. How is it possible that the pipeline phenomenon is occurring with such intensity in a country with such a strong tradition of female presence in science? Why do so few women reach the top level in their careers? What kind of professional trajectory are Polish female scientists experiencing? What is so specific in their biographical accounts? How does this specific historical frame (the 20th century with wars and conflicts as well as the Transformation Period) influence the scientific careers of women? Finally, how do they survive in a professional world which apparently denies them access to the top positions? What kind of problems have they faced and what strategies must they elaborate to stay active in such a 'hostile' universe and to dare (as at least some of them do) to balance their private/family life with career expectations constructed both by politicians of science (imposed by the bureaucratic system) and by the scientific community (maintained through a system of professional control and with use of formal and informal selection criteria)?

This article aims to give the possibility of understanding the specificity of the Polish case. We believe that the present is the effect of a long, dynamic, social process; therefore, we need to take a *longue durée* perspective to analyse it (Braudel, 1982). Thus, the socio-historical approach employed here is the most suitable for our objectives. In the first section of the article, we will start by describing the historical trajectory (interwar and 1945–1989 period) and elements of a cultural background which drive activity in the scientific universe. Then, we will present its contemporary institutional

frame (after the 1989 political change and the last higher education (HE) reforms, 2011–2013) as a context of career construction. That part will be mainly focused on political tendencies and institutional barriers, as well as the role of gender-based stereotypes. In the second section, we will employ field data to answer the questions formulated above. We will concentrate on the problems women face in the academic milieu (with strong emphasis in Science, Technology, Engineering and Mathematics (STEM) specialities) and show how personal biographies interact with the demands of the (in)formal, contemporary Polish HE system. In this part, a more private sphere will be explained. We will elaborate on two particular phenomena observed in the field – vampirization and the hidden career (Wagner, 2011a, 2011b, 2015a). In conclusion, we will present a partial explanation of the present situation as well as some directions for further steps in the study of women's scientific careers. This part may be considered as public sociology (Burawoy, 2005). Such involvement is linked directly with the employed methodology of long-lasting ethnographical study.

Methodology: From ethnography of a life science laboratory to biographies of scientists

This paper is based mainly on an ethnographical study conducted in several life science laboratories in four countries (France, Poland, USA and Germany) during a period of 12 years and conducted by Wagner (2011a, 2014, 2015a). The specificity of the ethnographical method stems from the lack of an *a priori* theoretical approach (before the start of data collection process); it requires elaborating working concepts during the observation and choosing research problems to focus on during the development of the investigation. One of the main topics of the research was processes of career construction. In each case, the focus was on an international team of workers. The conducted fieldwork constituted the basis for a comparative analysis (organizational structures, cultural, political and economic frame of the country of observation, institutional context). Yet, it was performed in similar (to some extent) work cultures that relate to the specificity of ordinary research work and the dynamics present in international teams of scientists who build their careers in the highly internationalized, contemporary scientific universe (more in Wagner, 2014).

The theoretical background employed in the analysis of the collected data comes principally from the Chicago Tradition (Chapoulie, 2001), especially from occupational career studies (Hughes, Becker, Strauss, Hall, Glaser, Hermanowicz). As a result of the first fieldwork, there emerged the concepts of *career coupling* (Wagner, 2006) and of *transmobility* (Wagner, 2011a, 2015a); both have become pertinent tools in the analysis of scientific careers. The second stage of this ethnographic investigation took place in a Polish laboratory (from 2006 to 2010). After that, the observation was led periodically, i.e. during short periods of going back to the field in order to interview the people who were part of Wagner's first intensive observation period.

Four years of the first part of this fieldwork were completed with interviews with researchers from outside STEM specialities and with short-term observations conducted in German and US laboratories. For the majority of the participants cited in this paper, the interview was not conducted at the first meeting but usually after several months of work in the same place. In this way the cited examples were gathered on the basis of a long working relationship, which had built participants' trust and prompted their cooperative attitude towards the researcher. By the same token, this increased the quality and reliability of the collected data.

The third important part of the ethnographical research was conducted in a leading US research institute (2010–2011). At that point, the preliminary concepts of women's career models in the sciences had already been elaborated on. Notions such as a hidden career or a vampirization process had been discussed with American scholars.[8] A deep ethnographical 6-month study was subsequently continued through regular meetings with the participants. These meetings have been periodically taking

place to date. The distinctive approach of Wagner's work relies on maintaining privileged contacts with some of the participants, as this allows people's trajectories to be followed over long periods, therefore detecting long-term dynamics that escape other types of research. The additional data were obtained from the study based on semi-directed interviews that Wagner and Finkielsztein conducted in 2013 with awardees of Polish–Swiss research programmes (Wagner and Finkielsztein, 2014).

Along with the ethnographic research, a considerable source of data comprises recorded biographical interviews (over 400) with researchers at each stage of their career (from MA students to over 90-year-old active or retired scientists). The majority of participants were laboratory scientists. However, about 25% of the data concerns specialists from disciplines other than the life sciences.

Our data were completed with readings of biographies and autobiographies of scientists, as well as historical books describing the activity of scientists during periods of war. In view of the fact that Polish science was an important element of the post-1945 history (as a continuation of the dynamic traditions in the fields such as microbiology, mathematics, anthropology and crystallography) and an important factor in political struggles (philosophy, history and sociology traditions), the number of available biographies is considerable. This abundance is in contrast with the scarcity of studies concerning sociological aspects of scientific and scholarly activity in Poland in the 20th century. Rare sociological studies (Cichomski 1976; Siemieńska 2000, 2007) lack a long-term perspective or broader view, since they focus mostly on researchers' contemporary situations. All those studies were conducted with in-depth interview (IDI) or questionnaires and did not use (to our knowledge) the ethnographical method which, in our opinion, remains the best investigative method for our purposes of understanding complex and often invisible phenomena such as discrimination (both explicit and hidden), unseen aspects of unequal treatment, self-discrimination and participants' own blindness towards negative practices and their consequences.

Women in Polish science (1918–2016): Politics of science, history of gender stereotypes

Beginning of the 20th century – New state and new challenges for a young society

As mentioned in the introduction, Marie Skłodowska-Curie (MSC) remains an iconic scientist in Poland. However, her example is not interpreted in the same way as it is in other countries. In Poland, MSC is not an example of a woman successful in science proving that being a scientist is not limited to men. Instead, she is a Polish scientist, not a woman scientist, and her image is used as a powerful tool for the construction of the Polish collective memory. What is noteworthy in numerous accounts about her life is that her political orientation, her cosmopolitan and communist opinions are missing. An interesting consequence of this image construction is also the elimination of all aspects of femininity. Her private life was severely criticized in the French press of the time.[9] Nevertheless in Poland, MSC has always been an object of veneration (birthday celebration, museum, media and books, history and science manuals). A national hero, sponsor, fund-raiser, science politician and a great scientist, MSC achieved more than many other people (including men) ever did. With such an example in mind, one would expect that discrimination and self-discrimination of young female scientists in the Polish society should be out of the question, especially as MSC is still regarded as a model to follow today (the Polish Parliament proclaimed the year 2011 as the year of MSC). And yet, as we will see later, one would be mistaken.

The second important aspect of the presence of women in scientific fields was related to an openness of the new state and an ideology emphasizing equal rights of access to education (a phenomenon typical of new states; see Walzer, 2015). Indeed, the presence of women at university was important, especially in new disciplines which had not yet been well established (i.e. with no fixed

hierarchy yet). We should note that the number of female students was significant. However, their life trajectory depended on their social class and the cultural capital of their family. Among those who continued in science there were a considerable number of 'heiresses' (daughters of academics and scientists) and spouses, as recorded in biographies and books devoted to scientific activity in 1918–1945. For example, in the lab of a famous microbiologist, Rudolf Weigl (the creator of the typhus vaccine; see Allen, 2014) several women were hired and they followed career paths similar to those of men. Frequently, those microbiologists were married to other scientists (commonly within the same speciality) and worked together with their spouses in laboratories (Allen, 2014; Kryński, 1997; Wójcik, 2015). However, daughters from upper-bourgeois milieus encountered particular difficulties on their path in science. A Polish-American scientist Wacław Szybalski,[10] in his biographical interview, recounted that his mother studied chemistry and was a gifted crystal-lographer. Yet, one day her professor mentioned: 'It is really a pity that you are a woman, since you are a gifted scientist. You will meet a man and you will marry him and have children and you will be lost for science'. It was a situation typical of women from bourgeois families – after marriage, and especially having given birth to a child, even educated women were supposed to retire and to concentrate on their households.

Such career models were common before WW2: either women aborted their professional activity after marriage or pursued their work (most frequently as a spouse of a scientist). After 1939 the situation changed and many women went back to work. Several accounts and testimonies provide examples of scientists who worked in the harsh conditions of concentration camps (for some, their work was a way to escape death; see Allen, 2014). The knowledge of scientists – specialists in chemistry, biology, etc. – was particularly cherished in times of penury and persecutions. Homemade alcohol and explosives, as well as all kinds of medicines (from vaccines to cyanide pills), were products of the highest need. It provided means to fight the occupier, but it was also the basis of a survival strategy and a source of money. It is impossible to provide statistics on women involved in the production of such items; however, we can infer their presence from testimonies and other types of writing.

PRL[11] – the post-war reconstruction of Poland

Women in science in PRL

Poland's political situation after WW2 was determined by the influence of the Soviet Union. In consequence, the position of women in Eastern European countries at that time was claimed to be equal to that of men. To that influence we should add the typical post-war situation in which women were welcome to take up vacated 'male' jobs in factories and other institutions in the classic 'Rosie the Riveter' pattern. New universities were created in place of the old ones; as the Polish territory changed after 1944–45, Polish universities in the lost territories in the east – for example, the Lviv University – were closed. The professors and scientists who survived found jobs in newly created universities in Lublin,[12] Wrocław (formerly Breslau) and Łódź.

Meanwhile, the general situation for women in Poland was improving.[13] As in the other Eastern bloc countries, the majority of employment consisted of public sector jobs with salary charts that prevented huge differences in salary between men and women.[14] All the same, both salaries were usually modest and neither alone would suffice to support a family. Women's salaries were therefore an important contribution to household budgets. Yet, as the gender–work division remained traditional, the double burden was bearable only where state provisions existed; that is, in cities and near larger state-owned enterprises that founded crèches, pre-schools and workers' canteens, which permitted the mobilization of the female workforce by alleviating the burden of the 'second shift' of domestic tasks (Stenning et al., 2012: 175–218). Elsewhere, such as in the countryside, women

performed traditional roles, taking care of the family and farm.[15] It was then possible to have a family life and a professional career, and Polish women living in cities rarely stayed 'at home'. The majority of the population of middle-class and working-class women were involved in their occupational activity[16] (working mothers in smaller families were considered 'normal', see Hardy, 2009).

Universities and scientific institutions were an important part of that social change. According to the data gathered by Renata Siemieńska (2003: 40), in the 1980s the number of female students at the university surpassed the number of male students. In those years the net enrolment rate amounted only to 7%, and the candidates went through tough selection processes (entrance examinations). On top of that, male candidates were under pressure of military conscription. For young men, therefore, enrolment meant a partial escape from widely disliked military service, and yet the proportion of female students remained important. In post-war Poland, until 1989, there existed affirmative action practices to combat class inequalities, the so-called 'points for origin': students from rural areas or working-class families obtained additional points in the selection process. On the other hand, there were no positive discrimination measures for gender issues. Despite these measures, careers in academia were not equally accessible to all classes or genders (the highest positions were mostly occupied by men). Scientists' social capital played a crucial role in the selection process. As Siemieńska stated:

> Scientific work has traditionally been considered men's work, even though by the close of the nineteenth century and the beginning of the twentieth, a certain number of women had been successful in science. For this reason, we may assume that women from families in which not only the fathers but also the mothers are university educated will more frequently be willing to embark on scientific and academic careers. (Siemieńska, 2003: 40)

In order to grasp the particularities and changes of social position of scientists in Polish post-war society, we should stress that the privilege of this particular occupational group did not come from a significant level of income. The scientific and academic elite members had the rare privilege to travel abroad while obtaining travel documents (passports for single or multiple use, permissions to leave the country etc.) was difficult. There existed also a possibility to be allocated a 'professional apartment' which, in times of housing penury, was very important, especially for young families. The prestige of an intellectual profession translated directly into raising one's quality of life. Finally, according to the study conducted by Wagner on several generations of scientists who emigrated from Poland (despite numerous restrictions imposed by different regimes and governments), the number of emigrated scientists was so high that, in the 1980s, becoming a scientist appeared to be a good strategy to emigrate without losing the possibility to pursue one's professional activity or downgrading one's social standing (Wagner, 2011a). Thanks to the currency exchange rates in that period, those who stayed abroad just for post-doctoral training (USA and Western European countries) were able to save enough to buy an apartment and a car – true signs of exceptional prosperity in Poland of the 1970s and 80s. To sum up: being a scientist was a good job in PRL.[17]

Transformation – a change of the dynamics for women in science. In 1989 in Poland, along with the first free post-war elections the Transformation[18] began. Poland was progressively changing into 'a democratic and capitalistic country' (Stenning et al., 2012). Several elements of that new context profoundly impacted the situation of Polish women. First and foremost, all strata of Polish society experienced the situation of unemployment. Downsizing enterprises started restructuring and – as a consequence – made many lower-qualified employees, who were typically female, redundant; the new employers were reluctant to hire women for fear of pregnancies. On top of that, subsequent conservative governments tried to promote family models with stay-at-home

mothers to push women out from the ranks of the workforce (Hardy, 2009). An ageing society, and lack of institutional care for children, seniors and disabled people required resources for domestic care (Charkiewicz and Zachorowska-Mazurkiewicz, 2009). These dynamics were reinforced by the Catholic backlash (being a good mother and care-taker). The growing power of the Catholic Church in Polish politics translated into restricting the abortion law in 1993 (Desperak, 2013). Despite social protests and some attempts to change the legislation in 1996, the so-called 'Polish compromise on abortion'[19] is still in place (see Szczuka, 2004). One of the major effects of the Transformation process is economic migration, not only by men or entire families but also by women (Urbańska, 2015).

The economic crisis and political changes created conditions of a risk society (Beck, 1992) and acute social insecurity (Castel, 2003, 2009). One of the aspects of 'Poland's new capitalism' and neoliberal policies was deterioration of social security, the health insurance system and childcare (Hardy, 2009). Many public crèches and nurseries were closed. For low-income professional women – such as young scientists and academics – this added up to difficulties in maintaining work/family life balance.

The years 1990–2014 were a period of profound changes in HE. In this paper we will not elaborate on the influence of new managerial policy and other neoliberal modifications that were observed at the international level (Shore, 2010). Instead, we will limit our analysis to those particularities studied in Poland and perceptible in other Eastern European countries.

New private or semi-private educational institutions emerged at the origin of 'the success of democratization of HE'. Contemporary Poland is among the countries with the highest net HE enrolment rates (about 40%). However, although the number of students grew in a significant way (from about 400,000 in 1989 to 1,470,0000 in 2014, an increase of about 250%), the number of teachers increased only by 50% (from about 61,000 in 1990 to 93,000 in 2014; Hermanowicz, 2013; Central Statistical Office, 2015). These data show changes in university teachers' working time structure. With modest salaries, instead of managing time for both research and teaching, they take several teaching positions at a time in order to earn a decent income. In research institutions which started benefiting from European and other granting programmes, for example to modernize equipment, maintaining stable research teams was difficult due to common salary levels. However, academics and researchers were needed in the new institutions and firms that were animating the new Polish economy (banks, private enterprises, service sector, rarely industry, national and EU institutions). Many Polish scientists, especially men, have changed their professional paths by partially or completely leaving academia. Their places have been taken by their female colleagues, who have decided to continue their university or scientific career despite the poor salary. This phenomenon is called by Siemieńska (2000) 'the winners among losers'. Compared with other EU countries, the situation of Polish women pursuing careers inside academia looks very good as the percentage of women in top positions is above the EU average. Nevertheless, from a financial point of view, the position of scientist or academic is less attractive than in the past, when fringe benefits and other privileges used to make up for modest salaries.

This is a very particular phenomenon; while in the case of Western European scientists and academics, gender inequality is due to stereotypes and organizational culture,[20] in Poland it was a structural and economic frame that produced the phenomenon of winners among the losers. This is why, even if statistics show that Polish female academics and scientists have the access to leaderships positions, it is due to the absence of males rather than to increasing gender equality.

Another important process related to cultural change concerns only female scientists and academics. Maria Janion, a Polish feminist and literature historian, talks in a press interview about the Transformation and explains its impact on women in academia, especially in humanities and social sciences:

Several years later [after the Transformation]… it has turned out that in free Poland a woman is not a human being, but a "family being", who instead of [being in] politics, should look after the home… I personally never had any illusions regarding "equal rights." I believe that attaining my present position cost me a lot more than it would [have] cost a man …. Among others, this happens because the so-called universal subject is in the long run constructed according to the male models. Men find it easier to adapt to the standards in force in the academic humanities. A woman must be several times better to be appreciated. These things are obvious to me – that's why I am always surprised by those successful women who claim that on their way to success they never encountered any signs of discrimination". (Janion, 1999: 25)

Our studies confirm that Janion's evaluation is accurate. The career path of Polish scientists and academics is built according to a model that is suitable mostly for men. New expectations that appeared in Poland with the Transformation and afterwards, as a consequence of Poland entering the EU or adopting the Bologna process in HE system, make the situation for women in science more difficult than it was in the past of the centrally planned economy. The Polish version of capitalism is not favourable to women.

Women's situation in Polish science (present context): Between institutional system and biography

Scientific careers at the time of globalization: A view from a peripheral country

In addition to the general deterioration of social factors (risk society, precarity, lack of social security, and health insurance as a rare good) which affects the population as a whole, women in academia and science experience extra difficulties in combining private/family life with professional expectations. The most important aspect, closely related to the internationalization of the scientific world, is transmobility – a core mechanism impacting today's scientific careers.

The concept of transmobility relates to a complex processual phenomenon which shows that mobility is built as a continuity of a relationship. It is a generator of information and knowledge and a source of other resources, which guarantees possession of an ensemble of techniques and know-how or of the 'international professional culture'. In other words, transmobility is both a process in which the participants acquire knowledge and skills, which makes them part of the activity of their professional universe at international level (an ordinary one in life sciences), and a context, which is the consequence of the technological progress (Wagner, 2011a, 2015a). This process is illustrated by Figure 1:

Transmobility as a social process consists of four stages related to a form of mobility and reputation (early, basic, expert and late mobility).[21] The above model reflects an ideal type. For example, European institutions have adopted age limits for the purposes of recruitment and categorizations; this, in fact, is a 'masculine' version of a scientific career which does not take into account the years spent on parenting.[22] This is an important and yet rarely recognized factor of gender inequality/discrimination. The requirements of such a path are difficult to combine with one's family life, especially with the obligations coming from raising children, which are still far from being fairly shared by both parents.

In other professions this kind of mobility has been expected or even required for decades (diplomats, high-level international managers; see Wagner, 1995). However, these populations are masculinized and usually enjoy a much better financial standing. High salaries, comfortable lifestyles and additional benefits compensate for mobility requirements and a particular temporality of contracts. Career tracking in diplomacy ensures certain security. In business, important incomes cover the needs of larger families (international school fees, etc.). Considering expatriates in cor-
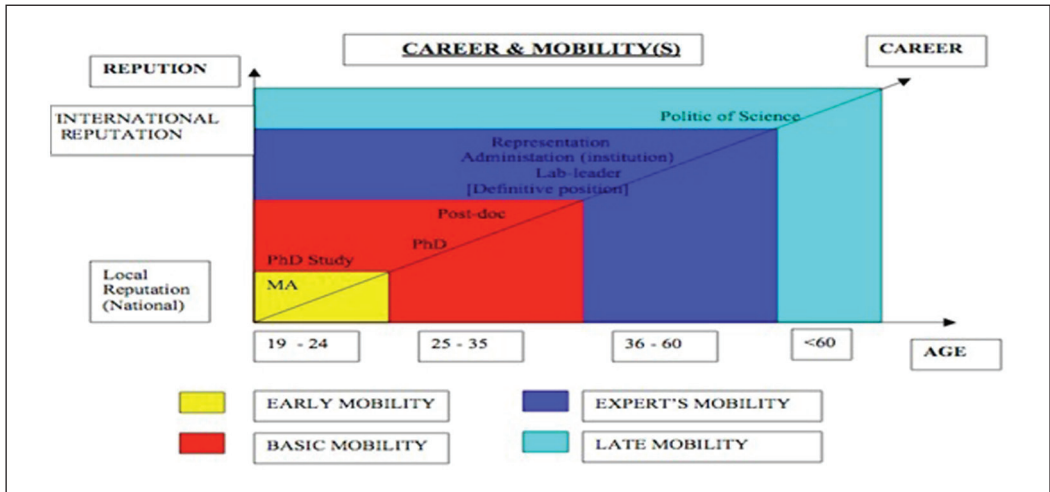
Figure 1. Career and mobility interdependence (Wagner, 2011a: 280).

porations or diplomacy, the living situations of scientists are not at all comparable. Post-doc salaries in the case of a scientist couple working in the US often do not cover daycare for one child.

When we analyse the situation of scientists of both genders (as well as scientist couples), we should take into account their economic status, the precarious situation of short contracts and transmobility requirements (the *sine qua non* for scientists from the majority of countries). This is exacerbated for scientists from peripheral countries, such as Poland[23] (to apply the Wallerstein's division), where internationalization of one's scientific career is strongly expected both structurally and culturally; structurally, as many universities and research institutions require long-term international experience for contracts beyond post-doctoral level. There are also limited resources for research, and modest equipment, especially in experimental research. The cultural element is related to the opinion largely shared by scholars and supported by the Ministry of HE and the national granting agency (National Science Centre, NCN), favouring the learning of skills abroad and 'foreign' expertise. In this phenomenon we may recognize typical patterns of a post-colonial attitude (Leder, 2014; Popow, 2015).

Poor financial support by the Polish state contrasts with the high quality of HE (thanks to a long tradition of university teaching in several scientific disciplines, high-level theoretical knowledge was transmitted, however only in some specialities; this quality has then translated in the practice of research[24]). To sum up, a professional trajectory of any well-educated graduate becoming a scientist necessarily includes scientific experience abroad. The career of a 'local scientist' (as was the case in France) is impossible in Poland. Today, to apply for a position in a research field (beyond post-doc), and according to rules implemented by the last reforms in Poland imposed by the Minister of Higher Education and Science in 2011, experience of scientific work abroad is required (especially for STEM subjects, which were the main focus of the conducted research).

Concluding the context part of the article, we should emphasize the unique nature of the situation of Polish women scientists as compared with all scientists and academics in Poland who pursue their occupations. We need a detailed explanation of their environment to understand why so many of them decide to have a family and raise children (we have no statistics about it, though – our data are provided by an ethnographic study). Those who have decided to combine their professional life with family life encounter grave difficulties in following the transmobility process.

When they choose to stay in Poland, they, perforce, limit their mobility (internal mobility is very low in Poland) and, in further consequence, risk impeding their career advancement.

We can also suppose that failures result from either unofficial criteria of selection or simply poor publication lists (caused by the requirements of their family life and lack of time for other time-consuming activities). This is not limited to Poland, but it is clearly visible in this country as the reform of HE officially imposed a career calendar and its model, which are difficult to follow for women with children or even for men with children. Scientists and academics are tacitly expected not to take care of either children or seniors.[25] This is a model for a single person who devotes all his/her life to scientific activity and is able to move frequently following the next opportunity to be hired on a short-term contract.

The above-mentioned major reform implemented by a neoliberal government (see Wagner, 2011b) imposes strict deadlines for every subsequent career stage. After accomplishing his/her PhD, a Polish academic teacher has 8 years to achieve habilitation.[26] While for some disciplines this period seems sufficient, for several specialities (fieldwork and experimental work-based research) the deadline is too short. It should be noted that for humanities and social sciences the habilitation process requires publication of a monograph or a series of highly evaluated articles – the process of publication is often very long. In practice, the time to finish the writing and for the whole habilitation process is 6 years. The birth of a child permits a postponement of the deadline by 1 year. However, for several specialities, particularly in life sciences, this is not sufficient, as pregnancy and breastfeeding make it impossible, for instance, to manipulate some dangerous products or toxic substances. However, this is only one technical specificity for exclusion from a scientific career. The general rule constitutes a criterion of selection that openly discriminates against women with children, and no efforts seem to have been made to ensure some balance between family and professional life, or even to guarantee a possibility of coexistence of both. Imposing such deadlines means exclusion of a major part of female researchers from advancement in their scientific careers. Siemieńska indicated a particularity regarding women's publication activity: while men start to decrease their 'production' after turning 50, women, on the contrary, become more active in publishing than they were before (Siemieńska, 2007). The curves for masculine and feminine scientific production differ not so much in the productivity but in temporal shape. Women get their habilitation later, and they have a lower publication score before the age of 50. Approaching this age, women start to have impressive curves showing intense scientific activity, and when their masculine colleagues slow down, women are at the peak of their performance. This scientific fact was not taken into account at all during the construction of career time-frame by politicians.

These aspects are present not only in Poland. The specificity of our case study resides in a certain 'allergic effect' against social protection measures, dissolution of stable employment and a lack of a representative organization to fight for improvement of work conditions. With such an approach by the workers themselves, the implementation of new neoliberal rules (such as imposing competition as the main model of existence in the scientific world, payment on results, short-time perspectives and a largely spread granting system[27]) came into being without much resistance. This capitalist model of financing and organizing the work in HE and scientific institutions is largely supported by the older generation of scientists who underline various negative influences of the security model implemented in socialist states. The politicians of science (usually former scientists who were educated and who conducted the first part of their career under the social system before 1989) have decided that competition and the American model of organizing science are more beneficial than the previous model (called 'communist') and claim that, in their new system, 'the excellence wins'.[28] This kind of attitude is common among scientists educated and working in former Central and Eastern European countries. These politicians do not realize the extent to which the previous system facilitated access to scientific occupations for those groups that today have no

possibility of pursuing those professions (especially lower-class people, and, with numerous above-mentioned reservations, women blocked in teaching positions).

The struggle for coexistence of professional and family life: Survival strategies of women scientists

The major factor affecting the presence of women in scientific positions at higher career levels (after post-doc) is their family situation. Both parents and partners play a decisive role in such a career orientation; parents, because of the position of the heirs (Becker and Carpenter, 1956; Bourdieu and Passeron, 1979). They transmit their professional and social capital as they socialize their children within the academic world. The presence of 'dynasties' and 'scientific families' in Poland is noticeable. These parents also create favourable conditions while their children are studying towards their PhD and post-doc, a period which is very difficult in the life of young scholars.[29] Finally, the children of academics share values with their parents and, therefore, they can benefit from their support (financially and otherwise: conferences, acquisition of books, workshop participation, coverage of study fees or supplementary courses), as well as from simple yet crucial help in covering the costs of living. Such parents support their children during doctoral studies. It is worth emphasizing here that in Poland the majority of PhD students are not able to afford an independent life because only very few receive a scholarship (which, by itself, in many cases is not sufficient for a family with children). Another important factor is that the necessity of being 'away from home' because of doctoral training or a post-doc contract abroad is well understood among scientific families. In other words, these young Polish scholars need parents who are not only able to afford to support them, but who also value their children's academic career highly.

A similar dependence is noted in relationships with partners. Understanding and acceptance for a specific work engagement and a 'style of life' (including mobility) is indispensable. The partner should follow the scientist and should share the same values in order to understand and support their passionate involvement in work. This is probably the reason why the majority of non-single people among those whom Wagner observed in life science laboratories (not only in Poland) were partners of other scientists (Wagner, 2011a).[30]

Analysing their career paths on the basis of Wagner's data, we see that up to obtaining a PhD both partners' careers usually evolve at a similar pace. After that, the choice of the next career step starts to differ with respect to gender. In the majority of the observed cases, a post-doc contract is a struggle that mobilizes several strategies. For couples without children, a temporary separation is taken into account. For Polish post-docs in numerous disciplines, the countries of destination are the USA, the UK and, after 2004, various EU countries. Some of the observed scientists had already gone abroad for long periods of time during their PhD training. The most common situation is to go for a post-doc position in the US – giving priority to the man while the woman would follow him with the plan of having a baby during the post-doc period. Several elements contribute to this choice: social security coverage (in Massachusetts, for example, it is much better than in Poland) and the American nationality given to children born on US soil (for historical reasons, a 'Western' passport has important value in Poland). Until the departure, the women and their partners (husbands, in the majority of cases) were usually equally advanced in their careers. However, the women usually stop their professional advancement by staying at home and raising children. Daycare costs in the US are too high to be covered by a post-doc salary.

In the case of both partners going on post-doc contracts, having a child abroad is really difficult (women have to obtain maternity leave as they need to take care of their newborns). One solution is to invite grandparents to take care of the children. However, if we consider that the majority of post-docs originate from academic families (or the so-called 'intelligentsia'), it is rare to see such

a solution in practice – sometimes, the parents send a person to stay at home with the children. This solution is opted for by numerous Chinese couples (in China the retirement age is 55 for women and 60 for men, and the one-child policy means there is huge pressure on grandchildren's education). However, all things considered, this solution is rarely pursued by Polish scientists.

The following example of a biologist couple (different specialities) illustrates the typical case of career development before and after the children are born during post-doc training. Alina and Jan had been a couple since the last year of their MA. After the first year of doctorate studies, Jan decided to go abroad to do his PhD in one of the best places in his field (Asia). The couple had a long-distance relationship for 2 years (with several short-term visits) and then Alina came for several months to join Jan but without professional grounds. After Jan got his PhD, the couple moved to the US (Alina finished her PhD in Poland a couple of months later). In the US, they stayed for two post-doc contracts (over 8 years) and Alina gave birth to their daughter there. After 6 months spent at home, Alina came back to work and had good conditions for combining motherhood with research work. Her boss (a woman at the last stage of her career) always understood the family obligations – she was an active feminist and fought to improve the quality of life of women scientists. Alina needed more time than her husband to finish her project, to publish. Jan advanced fast and was successful in obtaining an important grant and professorship position in Poland. They decided to come back. He promised to make efforts regarding her career advancement. He negotiated for her a position of an academic teacher and scientist at the same university (he was a son of a professor there), but she was not so successful in the game of getting grants and it took her as much as 6 years to start her own research group. At that time, Jan was almost at the top of his academic career and his position of a researcher at the international level was very strong. Then, they decided to have another child. When Alina was on a maternity leave again her work slowed down, even if she never really stopped working (while officially staying at home, she continued to read recent subject matter literature and wrote papers). Despite Jan's declarations about their equality in sharing the familial tasks and the responsibility of taking care of the children, as she said:

> You know, when a kid has the flu and you should take him to a physician and then take some days off it is always me, while his projects and his publications are more important. Sure! He has this big grant and a huge project, important dates and my work is much smaller than his – all can wait… this is always like this. (formal interview; however, Alina and Jan have known Wagner for 7 years and have a good friend in common; this explains the trust and close relationship)

This example indicates the most frequent dynamics which drive a couple's careers forward – the man's path is not really affected by having children or by the necessity of following the wife in her post-doc training, whereas the woman's professional advancement slows down. When both parents are doing their post-docs (or sometimes earlier training) in countries with a good welfare system and efficient family policy, the effects of slowing down are less pronounced in the careers of women. Not surprisingly then, a good childcare system is the primary reason for Poles to choose another European country as a destination. For instance, a scientist couple (a historian and a biologist) chose France for their post-docs because of a system of free kindergartens. Another example is of a woman scientist who chose the UK, as she decided to work there when her two children were of pre-school age. The financial and structural state support in those countries makes scientific work possible (in vivid contrast to Poland).

Sometimes, after a period of time spent giving birth to one or two children and rearing them through their first years (or months), young mothers come back to work. In the interviews, they all complained about the difficulties in combining work and its intensity with their involvement in family life. The main problem for all the female respondents is transmobility (perceived as the

main obligation, especially in STEM specialities), in terms of the challenge of maintaining personal life relationships despite frequent moves and home changes. Their temporary absence from the rest of their family (the partner and children) is perceived as a potential issue, especially if they do not work in academia. In such cases, women scientists reduce their international mobility to the minimum extent (short-term contracts) in order to fulfil the gender obligations imposed by the implicit hierarchy. Yet, such a solution also perturbs their family life, as illustrated in the following excerpt from an interview with a specialist in experimental physics who worked at a major (and rare) laboratory with full equipment in Western Europe:

> I had this style of life for years: 2–3 weeks of working abroad and 1–2 weeks back at home, but at this time I should teach and do all the bureaucracy work I could not do during my absence. I was completely starved and when our daughter was 6 years old, just 1 year before her getting enrolled in primary school, my husband said: OK it is without any sense that you are travelling like this all the time. You take 1 year of contract and we will go with you' And we went to the US and it was the best professional time in my life.

Men's testimonies concerning their international mobility, according to which it is usually their partner (and sometimes the children) who follow them for post-doc training, show a sharp contrast. The men take for granted the fact that their spouse will quit her job in Poland or postpone her professional plans in order to follow the husband. Even if some respondents do acknowledge that their partner 'did sacrifice', they rarely reciprocate. Reciprocity in this context would mean, for example, that after his contract the man would follow his wife, had opportunities arisen for her career. The situation of a wife being 'a shadow' of the husband is so common that is generally deemed 'natural'. The strategies are chosen according to men's priorities and their career development. Examples to the contrary, that is, when the woman's career is more advanced than the man's, are extremely rare.

Vampirization: Hidden careers of spouses of male scientists. When a highly specialized female scientist stays at home (because she is taking care of the children or because she has not obtained a post-doc contract in the same city as her husband), she has the time and knowledge to help her husband in his work. Such assistance takes various forms depending on the proximity of their specialities or disciplines. However, these 'household collaborations' are frequent as people find their matches and form couples during their university training and, in experimental sciences, they are frequently laboratory mates. These couples share specific knowledge that allows for long scientific talks and professional conversations at home. One of the physics specialists talked about his wife staying at home during his US post-doc and afterwards, when he got a permanent position in the EU (interview):

> Nobody helps me at such level as my wife. We studied together and she is very good in my field. After my work I come home, and I tell her all what I did, I discussed with my colleagues, I thought. She reads new papers at my place, because I have not enough time for it. She listens to me – you know even the craziest ideas. She discusses each of my thoughts and plans. I can trust only her because she is very smart and because… I have trust. She will not betray me – with my colleagues in the laboratory you are never sure what will happen. With my wife we are never in competition – she is the part of my brain. I am lucky.

As sociologists of work we will focus here on the division of tasks that the above-cited spouse fulfils: reading, listening, advising, counselling, discussing, organizing, thinking. Other interviews gave us the basis for completing this list: writing publications, editing texts, preparing grant applications, responding to letters, planning activities, correcting students' work, managing the calendar. All these tasks, in several cases, amount to a full-time job, and a very important job at that,

since it requires as high a level of knowledge as the person who is 'doing the career'; everything that those partners do requires a lot of skill and mutual trust. The spouse's job is not remunerated, and it is hidden, as only exceptional scientists acknowledge this kind of contribution to their work. We have found only one example of such acknowledgement – a French couple, who were physics specialists, worked in the same domain and published manuals and papers under both authorships. At the summit of their career they had their first child, then a second one. For health reasons the wife stayed at home, withdrawing from her experimental work (she kept teaching), but the authorship rule established in the past by both spouses did not change. Her husband explained that he alone works scientifically, but the wife checks, corrects his writing, discusses, and takes care of the family almost all by herself; this peaceful relationship is the origin of his enormous work capacity and creativity. This is why he maintained this double authorship – in recognition of those ordinary domestic tasks and hidden professional support for his career.

Vampirization (Wagner, 2011b) is the term that describes this contribution of women to their husbands' careers. Theoretically we could suppose the inverse situation, but Wagner has never encountered such a case. All the situations were as follows: the men used their wives' work without attribution (even symbolic, such as acknowledgements); such practice lasts for years and the man keeps pretending that he is the sole creator of his own career. The hidden career that shadows his career is not visible to other people; they perceive the effects of the contributions of two high-level scientists as the work of a single, outstanding specialist. We should not confuse vampirization with the Mathilda effect (Rossiter, 1993), as it is not directly a question of reputation construction. The first and main problem here is no recognition of the wives' hidden work, whereas in the Mathilda effect the names of female contributors are known. The reputation could be built (or not – as in the Mathilda effect) based on work that is signed. Vampirization is the phenomenon of using others' work and attributing it to oneself. Plagiarism is a different phenomenon, as the original work was published. In the discussed case, the author of the work stays anonymous. However, both partners frequently see 'nothing wrong' in that. The woman does not realize that she is employed without attribution or recognition, and her partner does not recognize that he exploits her work and knowledge.[31]

This is not a new phenomenon (see Deegan, 1988) and, for example, in previous generations of sociologists we note important contributions (more or less hidden) of their wives – they rarely had a chance to develop their own careers parallel to their husbands' careers.[32] We would like to underline this important phenomenon, for – according to our data – this situation concerns a significant proportion of Polish women in science and reflects their own way of finding some balance between the family life and the scientific activity. As they stay at home, the family benefits from privileged support. On top of that, helping the husband, even anonymously, is a way to stay active as a scientist – even if in a position similar to ghost-writing. This kind of 'sacrifice' is commonly accepted – for the sake of the family's wellbeing and the husband's career. To complete the section devoted to the vampirization process, it is important to note that this is a dynamic process and can occur to different degrees and in various forms: from loose discussions about unconventional ideas and reading of new literature to a full-time job of checking students' work, reviewing articles, grant evaluations, writing grant proposals, etc. This practice of being a scientist couple working for one single career is one of the most common traits of the studied population. It is also possible to see (in case of couples without children) hidden collaborations, that is, exchanges of knowledge, skills and information concerning career making and 'tricks of the trade' without putting an unequal burden of tasks on one of the partners. However, Wagner's work shows how this phenomenon is gender-determined, and to what extent similar processes of dependency and partial (not scientific but economic) exploitation that go in the reverse direction (men following women and putting their career on the second plan) are widely perceived as 'the world upside down'.

Men's 'sacrifices'

In rare situations in which men follow their partners, female scientists abundantly praise their case, underlining 'the husband's exceptional sacrifices'. It is interesting to notice that the term 'sacrifice' is rarely employed by men who describe the situation in which their spouses drop their jobs or interrupt their projects to follow them. By contrast, all women who experienced the situation in which their husbands followed them in their post-doc mobility employed this term. This observation constitutes an important point about gender division of roles in the construction of the career of the partner who is in the priority position as a breadwinner. If he is not a scientist, her work as a researcher is considered as a nice and extravagant hobby; in Poland, one can find multiple jokes and anecdotes illustrating this opinion. One of the privileged informants (female chemistry specialist) explains this phenomenon (interview):

> Time and again, the problem of a woman doing science. A colleague of mine is going to a post-doc and as she will gain money there, her boyfriend doesn't want to go as her dependent. There is such a problem. So they aren't checking all visa possibilities for this country because they don't quite know what they would do if this [a long-term visa for the boyfriend] was possible… [The respondent continues about her own situation.]

> Well, after that few-months stay [her former scholarship of several months] I just knew that staying without my husband doesn't make sense. On the other hand, it is a burden when a husband goes with his wife or partner and for some time he depends on her. Even if he himself can deal with it, the surrounding will never cease to remind him.

> I.W.: Who would it be?

> - The acquaintances… sometimes it pops up in the talks. Maybe not so much with us but it does pop up. My husband may not have admitted it but he… besides, he has always wanted to be a scientist and he cherishes what I do. Sometimes it's really an overdo, like when he somehow did everything to help my career and – well, I can see it now – when he is completely on his own he's doing very well but it was a burden to him that he was financially depending on me, to a degree. And he didn't really have any professional successes of his own. (Wagner, 2011a: 135–136).

In another case the husband's 'sacrifice' was not only to travel on his wife's visa but also to experience an important 'professional downgrading' of the husband. The above case is exceptional as the husband was an attorney in Poland and could not work as a lawyer in the US. He took a manual job and took care of the couple's daughter after kindergarten. Whereas in many cultures such provisional solutions are not perceived as negative, in Poland manual work is often associated with shame and personal failure. This explains why the respondent was so grateful to her husband. Asked by Wagner if after that period of mobility she had other contracts abroad, she responded that it was the only contract in her life for such a long time (12 months) and it is impossible to repeat this situation. This means that the woman will not be able to fulfil expectations of transmobility, and as a married woman with a child she will not be able to compete on equal terms with her male colleagues (or with women who are single or in a couple with another scientist). The situation of being a caregiver (of the children as well as of older parents) or having a partner who refuses a long-term separation almost immediately puts the career of a woman scientist in jeopardy, which can be associated with discriminatory policies and career models. The second element of this discrimination, as well as the inability to improve this situation in Poland, is a general insensitivity and ignorance about gender discrimination and the difficulties that women scientists experience when building their careers within academia.

A life of blissful unawareness

In 2014, the Polish Academy of Science organized a conference about careers in science. There were 18 participants (not all of them researchers in connection with the institution), none of whom was a woman.[33] The conference took place in the centre of Warsaw – the event was presented by a famous journalist and attracted numerous PhD students and young scientists. That missing presence of women was remarked on by only a few people from among those who had known about the conference beforehand (as the conference discussed new law regulations, the information was widespread). The critical remarks about the absence of female speakers (more to the point, none of the renowned scientific careers specialists had been invited) were noticed only by female guests, social scientists who are specialists in gender research or are feminist activists. Some of them boycotted the event, some found it scandalous. Nevertheless, no follow-up was organized to inform the public about this imbalance.

This story reflects the state and level of awareness about gender discrimination and fair practices (such as adopting a gender-balanced perspective in inviting key speakers to a conference). One sociologist expressed her opinion in an informal conversation, saying that when she is invited to a panel with male colleagues it is very difficult for her to have an equal place in the discussion (time allocation) and she is frequently treated as a decoration, additional 'furniture' to the circle of male experts. In many situations it is really difficult to play the role of an expert when the expert is female.

Disobliging comments are frequent and made by both male and female colleagues, such as in the following situation observed during the fieldwork: a female laboratory leader is commenting on her PhD student getting invited to a conference in Germany: 'I cannot understand why they are inviting her – probably they have seen a picture of her'. In Poland, so far we have not observed the practice of supporting young female scientists by their advanced colleagues (the exception could be the PhD mentor–mentee relationship). Non-official or unofficial rules help young women in their scientific career construction.

The following example illustrates a widespread opinion about women in science and their professional activity. At the Women's Congress that took place in 2012 in Warsaw, the Minister of HE and Science was invited (she sent her deputy instead; both politicians happened to be women) to the panel devoted to women in science. A young biologist asked a question about children and access to childcare institutions as, in her opinion, in the conjunction with low salaries, a family of scientists was not able to cover the fees of such care and at the same time pursue career advancement. The Deputy Minister responded that if someone is good at and passionate about science, nothing is an obstacle. She added that she herself had a daughter, who was a scientist and whose husband was also a scientist (both were historians), and that they educated their child without any negative impact on their scientific careers.

How can we imagine positive discrimination measures or political decisions being implemented to improve the gender balance in academia when the Deputy Minister of HE and Science takes such a stand in front of the public? This situation illustrates that not only public opinion or the scientific world are unaware about difficulties in pursuing a career in science in parallel with a family life. Politicians in charge of creating good conditions for scientific work are ignorant not only about gender imbalances, they also are not familiar with a widespread literature about professional women's situation in the contemporary societies. How is such a situation possible in the country that claims to follow in Skłodowska-Curie's footsteps?

Generational misunderstanding

The observed situation above is a perfect example of a common attitude among Polish women scientists. The older generation (the Deputy Minister was born in 1951) built their scientific careers

before the profound systemic changes in Poland. This means that they benefited from state-provided care and their children had full access to kindergartens, pre-schools and other kinds of institutions that assisted working parents in caring for and educating their children. The entire system progressively collapsed with the introduction of neoliberal capitalism. Ever since 1989, successive governments (left and right wing) have claimed that this was an indispensable part of the democratization process and the way for Poland to cease to be an underdeveloped country and to catch up with Western countries. The Deputy Minister and many other women of that generation did not realize to what extent the care institutions were important for the development of women's careers, and how the life of young academics in charge of their families is nowadays difficult.

The story below illustrates this profound lack of sensitivity and imagination (as well as empathy) towards younger colleagues. A female professor of biology was well known for mentoring women in a hard way, in particular not understanding their problems as young mothers nor the difficulties with involvement in their laboratory work. Young scientists avoided collaborating with her and a lot of PhD students were scared off because of her attitude. She always claimed that if a researcher is 'good',[34] children will not be an obstacle in their career building. She underlined that she herself had a daughter and she had worked all the time when her child was little. However, the same woman totally changed her attitude when her own daughter (also a young scientist) became a mother. Then, she became very sensitive about childcare problems and the inefficiency of help directed to young parent-scientists. She became an expert in all problems related to balancing family and scientific work. She said to her post-doc, during a coffee break taken in the lab: 'I did not realize how things have changed these last years'.

This is a crucial problem in career perception: even the people who do reflect on career issues only take into account, as a model to think about, their own experiences, which took place 20, 30 or 40 years ago. For some countries this is less of a problem (the situation is stable and the institutions are conservative). But in Poland, the entire social and working environment has changed. The experiences of previous generations are now irrelevant. It is impossible to think about, analyse and pretend to understand the professional problems of new generations simply by one's own experience. However, in Poland, the majority of politicians in the scientific world proceed without professional support (such as field advisers, or even properly conducted research providing deeper understanding and the larger perspective that we have developed in this paper). This unprofessionalism in career modelling and strategizing coupled with the lack of positive discrimination measures marks the particularity of our case. If we observe in Poland a series of actions undertaken to attract women to the sciences, the actions are copy-pasted from Western practices and have nothing in common either with Polish culture or with the current situation. At the same time, whereas the local context remains unresearched, a lot of money is spent on advertising. No efforts are made towards creating real measures that would help women to pursue their scientific careers without pushing them into a single lifestyle.

This double specificity (i.e. copy-pasting from countries perceived as 'developed' and the lack of local measures which disappeared during the transformation process) is reinforced with what we may call an allergy to social solutions. Practices of welfare, social mutual help and cooperation gave room to competition, commercial solutions and acute individualism. We should see this allergy-like attitude as a backlash reaction to the 'communist' times when positive social measures were implemented to help students originating from lower classes (working-class or rural areas). Such attitudes are perceived today in Poland as unjust, obsolete and simply wrong, which by consequence spreads to all kinds of social measures such as welfare-state provisions or positive discrimination.

The slogan 'if you are good, you will succeed in your career' is so deeply incorporated by new generations that small initiatives of PhD students cannot attract the support or even interest of their

older colleagues.[35] Each person is an isolated particle, and in such social un-cohesion each action aiming at improving work conditions among scholars is destined to failure. The conviction about the power of a human genius (in the sense of professional performance) completely eclipses the issue of decent work conditions. The blame for failure is on an individual, not on social or political structures and institutions. This situation makes any progress impossible. Young scholars who decide to stay permanently in Poland will struggle to pursue their scientific careers in parallel with family life. They cannot work in academia and have children without external financial support (family, grandparents). This is not 'difficult for them'; this is a mission impossible.

Conclusions and recommendations

The *longue durée* perspective helps us to observe an important (and probably typical of the so-called 'post-communist' societies) regress in women's rights; it also highlights persisting misconceptions about gender equality. When we think about women's rights, we usually consider an upward movement: women obtain more and more rights and are confident about a bright future of full equality to men. Meanwhile, the case study conducted among a highly educated population in Poland shows the impact that rights-stripping processes and dismantling of social achievements has on people's careers and lives. In our case, an important step back, especially in the field of institutional care, made the situation of Polish women scientists very difficult. This dark picture requires reaction in the form of implementing some positive measures.

The first step to an improvement would be a large push for information in order to end the blissful unawareness. The next step would be an affirmative action: the implementation of proportional quotas which makes women's participation obligatory in both events and selections (at each level of scientific activity). The third step is related to the creation of positive measures (institutional and organizational) to assist women in pursuing not only their scientific careers but also their family lives: the construction and implementation of gendered career calendar that would take into consideration childbearing and rearing, call for sharing the parenting burden by both parents, support the children's education and envisage solutions for other life events and processes. This will enable female scientists to reconcile both sides of women's life: private and professional. The lack of such support may be one of the main reasons why women drop their careers in science and academia (Smith-Doerr, 2004).

Certainly, transmobility expectations should be more flexible and extra funding should be guaranteed to women who are moving (in order to make the geographical move possible to the whole family). It is no longer possible to pretend that, with only 24 hours per day, women in charge of their families[36] are able to be as involved in professional performance as are their colleagues who are single. For instance, this fact is not taken into consideration in the majority of selection processes (for example, in grant attribution when juries proceed to evaluate publications). Such a system heavily nourishes the Matthew effect (Merton's and Zuckerman's concept; Merton 1968, 1988) and class discrimination.

Whereas in the case of the Matthew effect there is no need to elaborate on the issue (for those who already have a long list of publications the selection plays to their advantage, meaning the more you did, the more you will obtain), class discrimination is less clear, especially when we consider that a major part of the scientific population originates from similar social environments (middle-class parents, usually teachers, physicians and highly skilled employees). However, women with children who are involved in scientific activities frequently stay on track in their careers thanks to their husbands who, being high-level managers, businessmen or private physicians, are able to cover the expense of caretakers for their children and household. This situation strikingly resembles the reality of the 19th century, when a scholar or scientist (usually male) came

from a bourgeois or aristocratic family and was not under obligation to earn a living for himself and his household.

The situation of Polish women in science is particularly difficult, as this is a job with an important symbolic value that comes with expectations of outstanding personal involvement. At the same time, an important hostility within the environment is generated by neoliberal so-called 'productivity incentives', such as competition, huge pressure on fast career advancement and disproportionally low income in addition to a fixed and unjust age frame. In conclusion, this is a perfect example of intersectional discrimination when different aspects, such as gender, age, class, origin, parental profession, family situation (being a parent) together produce a certain discriminative synergy and punish those courageous women who just dared to try to pursue their scientific career – which in Poland is, basically, a professional path created for monks.

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None declared.

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Notes

1. The category of Pole is complex and needs further explanation (see Wagner, 2011a). Many sources (popular science books and journals) include in this category scientists born on the present territory of Poland (after 1945). For example, under this criterion, scholars (inclusive of Nobel Prize winners) born in the Polish city of Wrocław (previous Breslau) are considered to be Poles even if they considered themselves as German, Israeli or American. Here, Polish scientists are people who were raised and educated (partially, usually at the first stages of education) in Poland or on the Polish territory occupied by the Russian Empire, Austro-Hungary or Prussia (Marie Skłodowska-Curie was born in Warsaw, Poland in 1867. At that time, Warsaw lay within the borders of the Russian Empire. Thus, she was *de iure* a Russian Empire citizen).
2. In the studies conducted by Wagner in the biographical interviews, the book by Ève Curie is cited as an important element of the interest in science and even – the first 'decision' about becoming a scientist – not only by Polish scientists but also French, American, Italian and Portuguese ones. It would be interesting in the future to investigate specifically the influence of that book on the careers of scientists.
3. Eight women were elected: four from the Popular National Union; one from the Bloc of National Minorities (Roza Pomerantz-Meltzer representing the Zionist party), one from the Polish People's Party 'Wyzwolenie', one from the Polish Socialist Party and one from the National-Christian Labour Party.
4. Wykaz statystyczny słuchaczy w roku akademickim 1934/35 [Statistical catalogue of listeners in the academic year 1934/1935]. Available at: http://www.lwow.com.pl/ujk/4.html#statystyka (accessed 27 February 2016).
5. This important presence confirms the findings of Everett Hughes, a specialist in career studies and occupations (Hughes, 1971). According to the author of *Sociological Eye*, new specialities as well as niche activities are always more accessible to women and other 'discriminated' professionals (Afro-Americans, blue-collar workers, foreigners). Those non-mainstream trajectories are rarely pursued by people who are in power position in a given field (for science in the middle of the 20th century in the US it was a middle-class, white male).

6. The access to professional positions and to the University was unfortunately restricted for a substantial part of the Polish society – *numerus clausus* and bench ghetto were directed mainly to Poles considered as Jewish (see the case of University of Warsaw, Natkowska, 1999) and in some cases towards other 'ethnic minorities', for example in Eastern Poland – Ukrainians (Hnatiuk, 2015).

7. Available at: http://www.studiadoktoranckie.uw.edu.pl/files/clips/393.docx?1429190029 (accessed on 27 February 2016).

8. On 12th November 2010, at PENN Department of Sociology, Wagner presented a seminar entitled: *Walking is not always going straight right, sometimes it is step back… Women in science – their problems and challenges from Polish perspective*.

9. She had a love relationship with her younger and married collaborator, a father of young children.

10. Szybalski (a famous scientist, shortlisted three times for the Nobel Prize) concluded: 'The professor was right, but all was not lost for science as my mother had me'. This part of the interview indicates a huge sense of humour. One of Szybalski's main contributions to science was made with his wife – both signed famous paper and his wife is the first author (Szybalski W, Szybalska EH, Ragni G (1962) Genetic studies with human cell lines. *National Cancer Institute Monograph*, No. 7: 75-89). Their discovery of HAT medium is widely used and led to the development of monoclonal antibodies by Köhler and Millstein (awarded the Nobel Prize in Medicine in 1984).

11. PRL (Polish People's Republic) – the official name of Poland from 1952 to 1989.

12. Nowadays named after Marie Skłodowska-Curie.

13. For example, Poland was one of the first countries in Europe where medical abortion was legal (1956).

14. According to Anna Titkow (2007), those differences were present. However, in our opinion, the situation was not similar to that in Western countries, as the huge majority of workers were state employees and salaries were established according to bureaucratic rules which did not use gender criteria; there again, the difference could be noticed in terms of fringe benefits (bonuses, perks and 'prizes').

15. Poland had an exceptional situation with the smallest number of collective farms – individual agriculture proprieties were tolerated and thus widespread in post-war Poland.

16. There was actually no unemployment in the Eastern bloc countries – everybody was required to have an occupation and a work-place. The only exception to that rule constitutes the spouses of coal-mine workers (because of miners' high salaries).

17. However, for some scientific specializations, political turbulence and economic difficulties made ordinary research work difficult or impossible, as the costs of experimentation increased or outdated equipment in laboratories needed replacing. At the end of the 1980s, a considerable part of Polish scientists (the number is unknown) emigrated simply in order to pursue their research activity. Continuation of research in Poland was chaotic and without resources, or even – in many dynamically developing disciplines – downright impossible.

18. By the Transformation we mean specifically the process of change of the political and economic system in Poland, which was started by the first free elections in 1989 and continued in the 1990s.

19. That is, abortion is not banned altogether – it does remain legal in some situations such as when pregnancy poses a grave risk for the mother's life or when it results from rape.

20. Mentor's role in the acquisition of the first position and networking behaviour (Sagebiel, 2014); gender stereotypes preserving masculine homogeny in the leadership positions thanks to the perception of the close relationship between the leadership and masculinity values (Sagebiel, 2007).

21. Based on Wagner's work, this model was compatible with the discourse of EU politics of research which before 2013 emphasized the necessity of mobility of scientists. The ideology of politicians in charge of research strategies and the conviction about the power of geographic mobility was so strong that in the publications of European sociologists and in discussions between European researchers the term 'mobility' lost its social/vocational meaning and signifies only a geographic form of mobility. This is different in the US, where mobility is mostly related to social (or professional) upward mobility (vertical ascension), not to horizontal (geographic). This crucial role of the horizontal/geographical mobility was the origin of the construction of the term of 'Transmobility' defining the interactional process between geographical mobility and career advancement (Wagner, 2011a).

22. We are aware that some institutions take into consideration this phenomenon, allowing for 1 year of delay of the deadline per one child (which delays the limit age from 35 to 37 for women who have two children). In our opinion, this is not at all adapted (a child 'takes time' not only during pregnancy and breastfeeding periods).

23. Considering the percentage of GDP spent on scientific development and HE, Poland was at the penultimate position in the EU with 0.42 GDP (less than a half of %) – see Biecek (2012). In 2014 Poland spent 0.29% of GDP on 'science', which is among the lowest results in EU (letter addressed to the Minister of Higher Education in science signed by president of the Polish Academy of Science, the head of the Association of the Rectors of Polish Universities, the Polish National Center of Science and General Counsel for Scientific Activity, made public on the 7th of May 2015).

24. This difference between theoretical knowledge transmission and practical training is related strictly to a financial situation that a given university or research institute is facing; in Poland, financial support for research activity is among the lowest in the EU states (Biecek, 2012), which makes it difficult for the transmission of practical knowledge in several cost-intensive research areas (life sciences, physics, chemistry).

25. The problem of older parents is especially acute in Poland for two reasons – there lacks a system of care for older population and there is a tradition of several-generations households. Several participants in Wagner's studies mentioned this point as crucial for their decision of staying in Poland permanently and not being able to fulfil expectations of intensive international activity.

26. Habilitation is practised in several EU countries. This is the next step after obtaining PhD. To 2011, it was mandatory (e.g. in France). Now, without this degree, the work of a HE teacher will be much more difficult than previously. It is a degradation process – a sort of punishment – the burden of teaching hours has increased about 40% while the salary has decreased. It also degrades the title of employment: instead of being an associate professor (*maitre de conferences*), an academic becomes a lecturer. Recently, the HE sector has implemented a series of salary 'adjustments' (it is not a real improvement if we take into account the inflation level). A Polish associate professor earns about 800 euros per month; a full professor, 1300 euros gross; people winning granting projects have some modest complementation of their salary with (at the universities) an encouragement to choose half-time in order to have time for research (which, in reality, means half the salary from their teaching position too).

27. Research in Poland was once based on structural financial support planned by the state several years in advance and covered by taxes. This can be understood as an equivalent to American 'hard money' for research.

28. About the rhetoric of excellence in science see Wagner (2016).

29. Important popular articles about PhD depression, mental troubles of young scientists and other troubles that are typical of this hardworking and hugely under pressure population (in the *Guardian, Chronicle of HE* and other journals).

30. This is also the effect of specific socialization and education – two people become life-partners during their university learning period, while others meet their life-partners at work (in the laboratories); nothing specific in this situation, except a specific lifestyle to share.

31. Frequently, it occurs to the couple when they are getting divorced and the woman has to go back to work. Then, she realizes that she does not have a long publication list or other achievements; her contribution is hidden and cannot be mobilized in the search for a job.

32. See the life of following couples: Thomases, Znaniecki, Hughes (this was shared authorship), Merton (famous story of Matthew effect; Wagner, 2015) and many others.

33. Actually, none of the speakers was a specialist in scientific careers. They were biologists, chemistry and physics specialists – the only social scientist was a psychologist with expertise not related to career study. It seems that professional discussion about career in science was based on individual experiences of the invited scientists without expert and scientific points of view. As for a scientific meeting organized by the Polish Academy of Science, it was a surprising type of arrangement. As frequently occurs in Poland, politics, the government's strategies and actions of people who are at the head of institutions jeopardize scholarly meetings and discussions.

34. About excellence in science – from the perspective of the process of labelling – see Wagner (2016).

35. In 2010, young laboratory PhD students organized a petition for the right to social security – they reached over 2000 signatures of PhD students alone. Their older career colleagues did not feel concerned by that particular problem of precarity of PhD status.
36. This is most commonly the case in conservative Polish society, where we still observe the prevalence of the strong division between female and male family role and a lack of sufficient male support in sharing household and childcare duties.

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Academic couples, parenthood and women's research careers

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Abstract
The paper focuses on dual-career academic couples, how they combine careers and parenthood and how their strategies translate into employment pathways of researchers, and especially women researchers. Based on sixteen in-depth interviews with dual-career academic couples, the analysis identified two types of partnerships which differed in terms of how they combined work and parenthood and how they harmonized his and her career: 'traditional couples' and 'egalitarian couples'. While most previous research on dual-career couples analyses the individual level, this investigation considers the couple as a point of departure. The analysis is framed by the linked-lives approach, which studies partners' work paths as mutually interrelated. The analysis shows that in dual-career academic couples, women's careers are often perceived to be secondary to men's careers, but there were differences between women who built their careers before 1989 and contemporary young women researchers. It is argued that gender ideologies have different effects depending on the institutional conditions in which the ideologies are enacted. It is suggested that the paper contributes an important dimension to explanations of the gap in the position of men and women in the academic labour market.

Neoliberal reforms in academia have occurred in various cultural settings, and Central Eastern European (CEE) countries are no exception. These reforms are often implemented in environments which are in many respects specific. In the case of the CEE countries in general and the Czech Republic in particular, neoliberal reforms of the academic environment and the labour market

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interact with a conservative social discourse, unique in the European context, on the division of gender roles, conditions that are unsuitable for combining work and care and dismissive attitudes of political elites toward gender inequality, including the fields of research and development (Tenglerová, 2014).

The unintended consequences of the clash between neoliberal reforms and gender conservatism can be gleaned from the following statistics. The Czech Republic is one of the countries which fares the worst in Europe in many indicators relating to the status of women in science. The proportion of women among researchers was 27.2% in 2014, and the Czech Republic is in fact the only European country where the proportion of women in science is falling. In 2014, the proportion of women among researchers was at its lowest level since 2001, when gender-disaggregated statistical data were first collected – see Tenglerová (2015). In 2013, with 12% of women in scientific and management boards, the Czech Republic was bottom of the list in the EU (EC, 2013).

One of the approaches to explaining the difference between the percentages of men and women in research involved examining the conflict between working and parenting roles and the incompatibility of the performance of the research profession and parenthood (e.g., Mason and Goulden, 2004). As in other professions, the maternal role and related career breaks disadvantage women in building their careers in research (Acker and Armenti, 2004; Bagilhole, 2002; Harley, 2003). This is linked to the concept of the gender culture of the academic world (Acker and Webber, 2009; Bagilhole, 2002; Harley, 2003), conceptualized as a man's space which professes and reproduces masculine values incompatible with women's life experience and typical life biography. It may be presumed that in different cultural contexts these above-mentioned factors will play a different role and their impact may differ according to institutional settings and cultural specificities. Based on the evidence from previous studies conducted in the CR (Linková and Červinková, 2013; Vohlídalová, 2013), one of the key problems for women's careers in the academy is the combination of work and (child) care.

Since most researchers have a partner, and many men, but especially women researchers, live in dual-career partnerships (Dubach et al., 2013; Ferber and Loeb, 1997; Schiebinger et al., 2008; Wolf-Wendel et al., 2003) I focus on dual-career academic couples and the ways in which partners combine their professional careers and parenthood. I ask how these strategies translate into the employment pathways of researchers, and especially women researchers of various generations living in dual-career couples. In view of the demands of the research profession, dual-career academic couples represent a field where the conflicting pressures of the labour market and private life are particularly salient.

My analysis builds on the perspective of linked-lives which views the private and professional lives of both partners as interconnected (Krüger and Lévy, 2001). By focusing on the partners' work paths as being mutually interrelated, it is suggested that this study contributes an important dimension to explanations of the gap between the position of women and men in the academic labour market in the specific context of institutional and cultural setting. While most previous research on dual-career couples analyses the individual level, this paper takes the couple as a whole as a point of departure.

I first present the theoretical background of my study and the context in which choices of strategies for combining work and life are made in the Czech Republic (i.e. the organization of academia and conditions for parenthood). This is followed with a presentation of the methodology of the joint interview with academic couples, and then the analyses and conclusions.

Life-course, linked lives and coupled careers

The essence of the life-course approach lies in an interest in the ways in which individual aspects of life (such as the work path, the family path and institutional settings) influence each

other and how the course of these paths is affected by historical circumstances and changes in institutional frameworks (Elder, 1994; Krüger, 2009; Krüger and Lévy, 2001; Macmillan and Copher, 2005). The life-course approach also pays attention to the ways in which the lives of individual people influence one another, particularly those who are related – such as partners, parents and grandparents (Krüger and Lévy, 2001; Moen and Sweet, 2002). People's lives, their work paths and family paths are thus regarded not as individual projects but, rather, as a result of a number of other influences. Whereas the current notions of scientific excellence and professional paths exclude all aspects with the exception of individual effort, the life-course perspective brings these other aspects back into play and treats them as crucial factors which have effects on the ways the career game will play out. This approach has informed a number of studies on the position of women in science (see, for example, Bagilhole and White, 2013; Fox et al., 2011; González Ramos et al., 2015; Leeman, 2010; Mason and Goulden, 2004 amongst others).

Han and Moen (1999) talked about the need to view the work path and the family (private) path as interrelated and to take the relationality of the work and family paths of both partners into consideration. These authors criticized the myth of separate worlds which builds on the assumption that work and family lives are two separate worlds, reserved for men and for women, which are disconnected and do not intersect. With the concept of the 'coupled career' they insist that the professional path cannot be separated from the family path (Han and Moen, 1999: 99), and regard the couple as the main unit of analysis (Han and Moen, 1999: 101). Such a view provides the opportunity to ask questions about how the partners' work and family situations are interrelated, or whether and how one partner's work path affects the work path of the other (Han and Moen, 1999).

The notion of the 'coupled career' builds on the concept of 'linked lives' which forms the core of life-course approaches (Elder, 1994: 6). The concept of linked lives stresses the need to study how individual life paths are affected by other people and in what ways men's and women's life paths shape each other (Moen and Sweet, 2002: 467). In this perspective, men's involvement in the labour market and their career development are contingent upon the fact that their partners assume a larger part of caring for the home and family and are willing to put their professional career 'on the backburner' (at least in certain stages of their life cycle).

The perspective of the coupled career and linked lives is particularly suited for studying men's and women's academic careers because evidence suggests that many academics live in dual-career partnerships. The building of two careers is what distinguishes these couples from dual-earner couples where both partners have paid employment but only one of them is building a career (i.e. a job with which people identify, which demands a great deal of involvement and commitment and which is aimed at accomplishing personal goals and achieving success) (Rapoport and Rapoport, 1969: 3). Whether a partnership is dual-career or dual-income usually changes during the life cycle and is related in particular to parenting and the need to resolve the tension between working life and private life. According to Becker and Moen (1999) the proportion of couples among parents of small children who function on the dual-career model is negligible. Almost all are forced to limit their commitments in the work sphere and to reduce their career aspirations for a period of time (Becker and Moen, 1999: 999). The result is that in the life of a couple dual-career periods take turns with periods when the family operates on a dual- or single-income basis.

Krüger and Lévy (2001) place emphasis on the gendered impacts of institutional arrangements which influence relations between men and women in the family and the ways in which men's and women's lives intersect with and adapt to one another. As Krüger cautions (2009), the way in which partners' life paths intersect is not a question of a totally free choice and negotiation. Men's and women's life paths must be seen in the context of institutional conditions and structural barriers which shape people's choices and, relatedly, their life paths (Krüger and Lévy, 2001: 155).

Decisions about combining family and work lives are thus affected by many institutions, such as childcare, elderly-care or the educational system, which contribute to shaping women's and men's working paths. These institutions co-create invisible rules which to a certain extent limit individual choices and which form men's and women's life paths differently (Kruger and Lévy, 2001), thus affecting gender inequalities in society. Family policy and institutional childcare as well as the organization of the academic labour market are among the key institutional conditions that affect combining work and parenthood.

To what extent a woman's career must adapt to a man's and be limited by parenthood is not related only to the life-cycle, labour market settings and family policy; an important role is also played by the gender ideology of the couple (e.g. Beets et al., 1997; Kaufman and Bernhardt, 2015). A couple's gender ideology affects how women's and men's careers are combined, to what extent their careers are understood as having equal value in the family, and to what extent both partners contribute to childcare and housework. According to William and Denise Bielby (Bielby and Bielby, 1992) a couple's gender ideology offers a perspective through which the contributions of each partner to work life and private life are evaluated. This is reflected in the choice of whose career in the couple is given priority and who must adapt. Thus it is neither primarily the economic wellbeing of the family as a whole (see Becker et al., 1977; Mincer, 1978), nor the power between the partners related to their respective earning capacity (Eby, 2001; Green, 1997), that is the key factor.

Family policy and institutional childcare in the Czech Republic

The Czech Republic ranks top among European countries with regard to the greatest impact of parenthood on women's employment. While in 2013 the employment rate of women with children under six years of age in the EU–27 was on average 15 percentage points below that of women without children, in the Czech Republic the value has for many years been around 40 percentage points (i.e., one of the highest) (EC, 2014: 2). In addition to an overall gender-conservative cultural climate, one of the main reasons for this is the particularly long parental leave (taken mostly up to the child reaching the age of three), taken overwhelmingly by women, coupled with a severe lack of places in care facilities for children under the age of six.

A number of studies carried out in recent years which explore the transformation of Czech family policy point to refamilialisation tendencies (Hašková, 2011; Kocourková, 2002; Saxonberg and Sirovátka, 2006; Szelewa and Polakowski, 2008). The focus of childcare has increasingly shifted from public services to families (especially mothers or grandmothers); the share of children using childcare facilities has decreased (Hašková, 2011: 46). The period during which women remain at home with children has gradually increased: while in the 1970s it was mostly between one and two years, the 1990s saw the stabilization of the three-year parental model which still prevails today (Hašková, 2011: 43–44).

These changes are closely linked to the transformation of family policy. 'Socialist' family policies since the mid-1960s gradually extended the period during which mothers could stay at home until the child reached two years of age (Hašková et al., 2009). At the same time, the network of public childcare facilities was gradually enlarged. After 1989, the tendency appeared to be that women and mothers of young children were pushed from the labour market to the home (Křížková and Vohlídalová, 2009). As a result of a radical decline in fertility, and in line with the rhetoric of the 1990s, which condemned nurseries as a communist relic harmful to children, nurseries closed down on a massive scale (Dudová and Hašková, 2010). In the 1990s the full-time mother who stayed at home with children until they were three years old became an almost universal norm. The reform of the 'multispeed parental leave', which came into force at the beginning of 2008, has not affected this norm significantly. The so-called 'multispeed parental leave' newly allowed parents

to choose freely a parental leave period of two to four years[1] (previously they could choose only between three or four years of parental leave);[2] but in reality the choice of the shortest two-year option, which would in many cases be welcome to young researchers, remained purely hypothetical (mainly due to the unavailability of childcare facilities).

Regarding the share of young children in care facilities, the Czech Republic does not fare well and is nowhere near reaching the Barcelona objectives of 90% of preschool children over the age of three and 33% of children under three years of age being placed in formal care. With regard to children younger than three, their coverage through formal care in the CR does not even reach 5% (the EU average was around 26%); in the case of children aged 3–6 the Czech Republic reached the below-average value of 72% in 2013 (compared to 82% in EU–27) (Janta, 2014). These low values for the CR cannot be compensated for by private babysitting services, which, due to their high costs, are used by only around 1–2% of households (Hašková, 2011: 21). The shorter parental leave pays off economically only for women who have significantly above-average incomes (Jahoda and Šinkyříková, 2011), or those who have parents of their own willing to provide time-intensive care for grandchildren.

The model of three-year parental leave is a generally accepted standard considered to be the 'correct' form of childcare in Czech society. The public discourse on this issue is controlled by experts who emphasize the negative aspects of collective care on child development (for details see Dudová and Hašková, 2010; Saxonberg et al., 2012). The need for peer contact among children under three is disputed, and intensive maternal care for children up to the age of three is constructed as the only correct model of care. The child's interests are framed as conflicting with the mother's economic activity (Dudová and Hašková, 2010: 42–44).

Academic labour market and its transformations

In the last few decades Czech science has undergone major changes. Science and research in the Czech Republic in the 1990s, and before the Velvet Revolution in 1989, was characterized by the absence of research assessment, a low level of competitiveness, and a low rate of competitive funding (Linková and Červinková, 2013; Linková and Stöckelová, 2012). Academic mobility, before 1989, was limited, primarily for political reasons. A key aspect of assessment and career progress was party affiliation, not performance (Šebková, 1994; Štrbáňová, 2007).

The introduction of the Evaluation Methodology in 2004, often regarded as an important milestone in the development of Czech science, became several years later the basis for the allocation of institutional funding for research and development (Linková and Červinková, 2013; Linková and Stöckelová, 2012). As a result, a significant change occurred in the system of Czech research funding, increasingly concerned with and focused upon competition. As Linková and Červinková (2013) pointed out, these processes are the manifestation in the Czech context of transformations of science described by Ziman (1996) as 'post-academic science' and by Gibbons et al. as 'Mode 2 science' (Gibbons et al., 1994). This 'new' type of science is characterized by an obsession with performance measurement and accountability, increased competitiveness and growing precarity (Ziman, 1996: 74–75).

Gradually, institutional funding has decreased and the dependence of academic institutions on competitive funding has increased. In addition, the growing pressure on academic mobility is also in evidence (Červinková, 2010; Vohlídalová, 2014). As a consequence of these processes, the organization of the scientific labour market and research teams has become more dynamic, including aspects such as the disappearance of the position of independent researcher (a senior researcher who usually had a stable work contract, had their own research agenda, and trained students), the increase in the number of temporal postdoctoral positions demanding extreme mobility (in space

and time) and competitiveness (Linková and Červinková, 2013), and the overall decline of labour standards in the scientific profession (Bauder, 2006).

Such a highly uncertain work environment presupposes the existence of a perfectly mobile and flexible worker who is willing to devote their full time to work and has no caring commitments in the private sphere. The ideal of the scientific career path continues to be a linear career uninterrupted by long pauses (Acker, 1990; Bagilhole, 2002; Mason and Gulden, 2004). It appears that, in particular, the values concerning maximum work effort, and the need to dedicate oneself more than full time to science and to reduce the lenght of career breaks related to childcare to the absolute minimum, are strongly internalized by Czech scientists and form a kind of unwritten ethos for the performance of the scientific profession (see Cidlinská and Linková, 2013; Linková and Červinková, 2013; Vohlídalová, 2013). Such a notion of a career is strongly gendered: it is tailored to men, or a certain type of masculinity, and disadvantages women. Another example of this is the way scientific excellence is defined, with activities which are often performed by women being systematically excluded (e.g. administration of projects, working with students, and care for the everyday functioning of the workplace). Research assessment procedures usually consider and value absolute performance only and do not take into account the time that was actually spent on these activities (Harley, 2003). For women especially the enormous pressure on academic mobility during the early stages of a career may be equally problematic (Ackers, 2004; Ackers et al., 2007; Leemann, 2010)

The construction of the research profession based on a typically masculine career model offers an explanation of why the organization of science and research institutions is usually at variance with motherhood or active fatherhood (Acker and Webber, 2009; Bagilhole, 2002; Harley, 2003). Motherhood and parenthood often occur and are considered as an event which is not really expected in researchers' lives (e.g., in terms of the in flexibility of grant programmes, career rules, etc.). If any form of parenthood is admitted, it is "minimal motherhood". The research profession demands that women return to work as fast as possible, and the notion prevails that it is impossible to catch up on a break of several years. If women decide to take a longer career break, their professional role and research competences are questioned (Linková and Červinková, 2013; Vohlídalová, 2013). Furthermore, the issue of combining work and parenthood is trivialized and relegated to the personal level. Often the opinion is heard that women can freely choose how they will combine work and parenthood and that this decision is an issue of their priorities and motivations. In sharp contrast to this, however, are institutional conditions and the ideology of motherhood which both prioritize a long parental leave. If women return to work earlier, they upset the norm of "intensive motherhood" (Hays, 1996) and thus run the risk of their maternal role being questioned. Women researchers thus find themselves caught between two completely contradictory systems of norms and values. It is clear that the genuine possibility of making a free choice is limited, and that the conditions for combining work and parenthood are inadequate (Linková and Červinková, 2013; Vohlídalová, 2013).

Methodology

The analysis is based on 16 in-depth interviews with Czech dual-career academic heterosexual couples (married and unmarried), in which both the partners were working in research or at a higher education institution. The interviews were conducted in 2009–2010 via the joined interview (Allan, 1980) with both partners at the same time. The sample included women and men researchers of various generations in various life stages – from young doctoral students at the beginning of their research career through to established women and men researchers at the peak of their career and those who were gradually phasing their careers out and whose children were adults with their own families. The age of participants varied between 26 and 75 years. Couples from natural sciences

(including medical science) predominated in the sample: two couples comprised researchers in the humanities, one couple comprised one researcher in the social sciences and one researcher in the natural sciences, one couple included researchers in the technical sciences, and 12 couples comprised researchers in the natural sciences (including medical science). A detailed description of the sample is presented in the Appendix. The higher level of representation of researchers working in the natural/medical sciences in the sample occurred for two reasons: (1) couples from the social sciences and humanities were often anxious about providing the interview and they often refused to take part in the project (they were generally more conscious of their privacy than couples in natural science); and (2) whether a researcher is or is not living in an academic couple is usually not made public, and therefore I had to rely mainly on snowball sampling. The recruitment of participants via public advertisements proved to be not efficient enough (only two couples were recruited via public advertisements). However, the composition of the population of researchers in the public research sector in the Czech Republic indicates that the sample may correspond well to the overall composition of the research population (Tenglerová, 2015): natural science (including medical science) and technical science comprised 85.4% researchers, whereas only 14.6% of researchers worked in the domain of the social sciences and humanities in 2014 (Tenglerová, 2015: 24).

In my analyses I build on the principles of grounded theory (Glaser and Strauss, 1967; Strauss and Corbin, 1998), and specifically its constructivist version (Charmaz, 2004) according to which interviews are a reflection of an interpretative process of a person. The goal of the analysis was therefore to understand subjective meanings and to study how these meanings are created by the participants.

The interviews were transcribed verbatim and analysed using Atlas.ti software. In line with the principles of grounded theory the interviews were gradually coded in several stages, from codes narrowly linked with the data to more general and wider analytical categories. Constant comparison was the basic analytical method: that is, seeking similarities and differences in the data between categories, their characteristics, codes, participants and other aspects (Glaser and Strauss, 1967: 22). Also in line with grounded theory, I adopted an inductive approach to formulating theses, hypotheses and typologies.

Analysis

In my sample I identified two types of partnership that differed significantly in how they combined parenthood and two academic careers (i.e. how they interacted and limited each other) as well as what effect parenthood had in particular on the woman's career: egalitarian and traditional couples. Although some authors believe that dual-career (academic) partnerships are remarkable for their egalitarian gender ideology and attitudes to the division of housework and childcare (see, for example, Austin and Milem, 1997: 141; Duxbury et al., 2007), research has shown that many of them professed a traditional gender ideology (Rusconi, 2002). This finding is also supported in this study: of the total number of 16 couples only six can be regarded as egalitarian partnerships, with the other 10 couples being traditional partnerships.

Egalitarian couples

A traditional division of labour still prevails in the Czech context such that women perform most of the care in the home and family (Chaloupková, 2005). It appears that an equal division of domestic work and childcare is more common among today's young couples than it was among the older generation. In this study too, egalitarian couples belonged mostly to the younger generation.

Egalitarian couples placed the career of both the partners on the same footing, attributed to it the same significance and actually shared childcare and housework equally. These couples labelled themselves as 'egalitarian' and many professed a strong egalitarian rhetoric. An equal division of competences was understood as something matter of fact, necessary and correct. The frequent argument was the same level of seniority of the two partners:

> We both work in the same position; we do the same things so there is no reason why it couldn't be like this [with equal division of work and care]. I think that it's logical that way. (Bořek, 33, M, humanities)[3]

Some women and men researchers in egalitarian couples were critical of the traditional division of family roles between 'man the breadwinner' and 'woman the carer', which they perceived as unsuitable:

> …I can't imagine that it [care for a daughter] would be up to me alone. That five days a week my husband would leave in the morning to go to work and come back in the evening. (Věra, 26, F, natural sciences)

The egalitarian organization of gender roles was regarded positively not only by women but also by their partners, despite the fact that this arrangement places greater demands on them in terms of adapting their work paths to the needs of the family and their partner's career than in the traditional couples. The words 'share' or 'take turns' were typical expressions used by the partners to characterize how they combined work and care.

Sharing childcare and housework, often in combination with grandparents' time-intensive help with childcare in the case of young couples and with the help of private childcare and nurseries in the case of older couples, created conditions for women to return from parental leave relatively early. Mostly, they returned after six months; that is, they completed a maternity leave which in the Czech Republic is considered to be the minimal period for parental leave, thereby avoiding the stigma of a longer break seen to breach the ideal of the linear scientific career.

The egalitarian attitudes in these couples to the partners' work lives are also related to their attitudes to mobility. Usually, they considered the effect of mobility on their partners' career prospects and refused to expose one another to the problem of 'tied moving' (Mincer, 1978) – that is, a situation in which one of the partners moves because of the other partner's job offer without having an adequate work position in the new destination.

If these couples go on a fellowship, they mostly go together in the way, for example, that interviewees Dita and Dalibor arranged their fellowships, by taking turns as to who chooses the fellowship destination. They choose destinations which ensure that the other partner can also find work at a research institution, even if that means moderating their expectations (i.e. temporarily not working in their specialization, etc.). They did not assume that the person who would be doing the moderating would be Dita alone.

> I think a solution would be to go somewhere where Dalibor will be the one doing the primary choosing and then we could go somewhere where I would be doing the choosing. (Dita, 28, F, natural sciences)

This couple also specifically chooses research institutes in countries which offer good conditions for combining work and parenthood in terms of a quality childcare system. Rather than the most prestigious institutes, they seek establishments where both of them will be able to find a fellowship.

Men (and women) from egalitarian couples planned their careers with regard to its effects on their partner's work path. Men's (as well as women's) careers were adapted to the needs of the children and partners (for example, in terms of academic mobility or partial reduction of their workload

after the birth of their child). Unlike in traditional partnerships men from egalitarian partnerships reflected spontaneously on the fact that the birth of their child had an impact on their work lives and that they had to slow down a bit (i.e. not applying for mobility grants, turning down additional commitments on boards and committees, etc.). The narratives of these couples did not suggest that the woman's career should be negatively affected due to parenting, the partner's mobility or career growth. In all the egalitarian couples in this study, men and women were in a similar position and level of seniority and it was not clear that their work paths diverged significantly during their life course. The overall progression of the work career in this form of partnership was much more balanced than in the traditional partnerships.

Egalitarian partnerships create significantly better conditions for women to combine work and parenthood than do traditional partnerships. However, this arrangement also places many more demands on men to adjust their workloads and career decisions (e.g. concerning mobility) according to their family's and partner's needs, especially if there are young children in the family. Thus they could not have built their career as freely as men from traditional couples. It was not surprising, then, that they frequently occupied lower positions in the academic hierarchy, such as independent researchers, postdoctoral researchers or doctoral fellows. The only exceptions of egalitarian couples where men reached higher academic ranks were, first, Nina and Norbert (both full-professors and current or former heads of research institutes) who belonged to the older generation and who started their academic careers during the period of state socialism, when the conditions for combining work and care for young children were much more favourable; and, second, Matěj and Marie (Matěj is an associate professor, Marie is an assistant professor) belonging to the young generation, who were expecting a (first) child and so their careers had developed thus far as a childless couple.

The academic careers of the four remaining egalitarian couples suggest that the current design of family policy and the academic labour market are less favourable to a positive sum game for both partners, although further research to confirm this hypothesis is needed. Moreover, we have to take into account that men themselves evaluated their egalitarian family setting in a very positive way and that they valued the impact of the family setting on their relationship with their children and partner. In the context of well-being and life satisfaction, the egalitarian couples are thus likely to represent a win–win situation for both partners.

Traditional couples

In these couples the man's career was generally seen as more important than the woman's. Women's careers were supposed to adjust to the needs of their partners and children. In some cases this ideology was openly stated during the interview:

> Of the two of us, my husband is the 'proper' scientist. I am more of a research assistant and therefore I could have always made the time somehow [for childcare and house work]. (Eva, 68, F, natural sciences)

The quotation above underscores the typical feature of this group: in the traditional partnerships childcare and housework were constructed as a naturally-given woman's work which was not usually discussed or negotiated by the partners:

> I think that my wife took it on somehow just naturally. (Karel, 62, M, natural sciences)

In most cases, at the time of the interview the man was in a higher academic position than the woman. In approximately half of the couples the partners started off at the same starting line (they were often classmates at university). After the birth of their (first) child the difference

between his and her work positions started to increase as the woman was automatically expected to adapt her work ambitions to the needs of her partner's career, the family and the child. The women did not see this as a problem. They often talked about the fact that they themselves decided on this model or that they accepted this situation as a fact. Men in these couples usually built their careers regardless of their partner's work path. Their career advancement was often contingent upon their partner assuming the entire responsibility for childcare and housework and following their partners on foreign fellowships, often with children.

A typical example of a strongly gender traditional couple were Olga and Ondřej, parents of two children of preschool age. Before the birth of their children both the partners held the same position – they were classmates who graduated together from master's and then doctoral programmes and went on a postdoctoral fellowship. Olga achieved greater success than Ondřej; she received a prestigious award and managed to publish a paper which experienced a very high level of citations in the literature. She was also more successful in terms of procuring grant projects. Despite this, after their first child was born she reduced her professional activities to a minimum. She understood this course of events, as Ondřej did, as something matter of fact and unproblematic:

> Ondřej must have a full-time [job] and I will have as much as will be possible. As the children gradually grow up, it will increase. (Olga, 36, F, natural sciences)

While Olga had already been at home on a parental leave for five years at the time of the interview and was gradually returning to work part time, her husband, free from the duties of household care and childcare, gradually progressed to the position of leader of a research team. While the birth of their children significantly affected Olga's scientific career, Ondřej's answer to a direct question about whether parenthood affected his life was:

> I don't think so. It's given by the fact that my wife understood that she would dedicate herself to children and I to science. And I was dedicating myself to science before, so from my perspective nothing really significant changed. (Ondřej, 36, M, natural sciences, young generation)

Olga answered the same question in the following way:

> I won't be a senior researcher; I will probably never lead a research team. But I can return to work and be useful, even after five years. (Olga, 36, F, natural sciences)

The story of Olga and Ondřej is exemplary of what linked-lives mean in reality, with his steep career progress to the position of a very successful principal investigator being traded off against her career stagnation. The paradox of many traditional couples, as in this case, is that this arrangement is regarded as voluntary, free and advantageous all round, even though many of the women complained about being double-burdened. The different weights given to his and her careers were then reflected in differences in perception of the impact of parenthood on their work lives. While in the egalitarian couples women's and men's answers were generally in agreement, in the traditional couples the perspectives of the men and women diverged. Older men in traditional partnerships often remembered the period when they had small children with a degree of nostalgia as a happy time and, similar to young men who have small children today, did not admit that parenthood interfered with their professional life in any significant way. Even if they considered the traditional division of gender roles as something natural, women of all generations talked about feelings of exhaustion, stress, lack of sleep and the difficulties of combining work and parenthood as well as major career stagnation.

Women in traditional partnerships often accompanied their husbands on fellowships and stipend stays where they either did not work at all and cared for children and the home or worked part time, often on very small contracts and without pay. For many women the experience of tied moving in particular was that of a significant brake on their work career and an increase in the difference between his and her position:

> In the three years we spent in the US I spent only three months in the lab. So compared to women, men are certainly much better off, also because they don't slide back because of children. (Jiřina, 37, F, natural sciences)

From the perspective of linked lives and coupled careers (Kruger and Lévy, 2001) it appears that the high degree of men's geographic mobility, on which career development in science is increasingly predicated, is especially contingent upon their partners' willingness to adapt to the needs of their (the men's) careers (see also, for example, Leeman, 2010).

Major differences appear between the ways the younger and older generation of traditional couples combine work and parenthood. In both cases childcare was considered to be primarily the woman's concern; nevertheless, most women researchers in the older generation returned to work after parental leave relatively quickly (generally after one or two years) because of the possibility of placing children in nurseries and the general organization of the research profession at that time. Since the mid-1960s, and especially in the 1970s, during which time the majority of women scientists in my sample gave birth to their children, the condition for a combination of work and care significantly improved. The period of maternal/parental leave gradually extended up to two years of age (in the 1970s) and later up to three years of age (in the mid-1980s) (Hašková et al., 2009). At the same time, a network of public childcare facilities, both kindergartens and nurseries, was gradually enlarged and widely accessible. Women thus had a choice of returning to work from a parental leave early after childbirth – as many women scientists did. As indicated by interviews with women of the older generation, their ideology of motherhood largely reflected the rhetoric then prevalent which emphasised active participation of mothers in the labour market. The academic labour market at that time was characterized by a lack of competitiveness and an absence of performance measurement, and was based on long-term funding which provided conditions that eased the return after a parental leave, as well as the combination of work with care for small children.

After 1989 the tendency was to cut public expenditures for childcare (Hašková et al., 2009) and to push women, and especially mothers of young children, out of the labour market (Křížková and Vohlídalová, 2009). The gender-conservative discourses stressed the women's right not to be employed and the socialist project of women's emancipation was subjected to strong criticism. From the 1990s almost all the nurseries and a large number of kindergartens started to be closed down and parents had to accept a lack of childcare facilities and an extremely gender-conservative notion of 'proper' motherhood. At the same time, the young generation of women scientists have to deal with combining work and care in the conditions of a neoliberal transformation of the academic labour market resulting in it being organized with regard to competition, research performance measurement, temporary financing and increasing economic insecurity.

While young women today return part time after a parental leave of two or more years and they gradually increase their workload, the older generation of women researchers returned full time and generally dropped out for a shorter period of time (many of them returned after six months or no longer than one year). The handicap of the traditional division of gender roles between women and men of the older generation, in terms of caring for very small children, could have been at least partially compensated for with the help of available childcare facilities and the organization of the scientific labour market at that period, even if it was often at the cost of major efforts. There were

two cases among the gender traditional couples of the older generation in which the women managed to achieve a work position comparable to that of their partners despite the unequal family arrangements. Traditional partnerships, viewed in particular against the backdrop of contemporary organization of research and family policy, create an environment much less conducive for building a successful career in science for women than do egalitarian partnerships. Women's careers in these partnerships can be under permanent threat because the women are always ready to yield to the demands of the partner's career and the needs of their children and family. The conditions that this model creates for combining work and parenthood are not suited to the needs of the research profession. Parenting and housework are seen in these couples primarily as her, not their common, concern: in particular in relation to parenthood, the gap between his and her careers consequently widens. In comparison with the group of egalitarian couples, there were many more men who reached the higher levels of academic hierarchies in the group of traditional couples – two of the 10 men in traditional couples were research group leaders, four reached the position of full-professors and two were appointed associate professors. The traditional couples thus represent a setting that is strongly beneficial for men's careers.

Conclusions

The perspective of linked-lives which sees the lives of both partners as interrelated entities brings a complex view of work and life paths of women and men in science and makes it possible to examine how men's and women's work paths mutually affect and link with each other. In my analysis I identified two types of academic partnerships which differed in the ways they combined work and parenthood and in the ways they harmonized his and her careers: traditional couples and egalitarian couples. It transpires that a balanced career progress of the partners is contingent upon balanced sharing of roles between the partners and egalitarian gender ideology in the couple. Conversely, situations in which the partners' career paths start to diverge significantly and women stagnate professionally are related to traditional gender roles in the family when a woman bears the entire responsibility for childcare and housework and when her work path is seen as secondary. There is a trade-off between the man's career advancement and his partner's career stagnation.

This typology underscores the important role of the gender ideology and division of labour among partners which affected significantly the impact of parenthood especially on women's career progress. This finding supports previous studies which linked traditional gender role attitudes with women's work adjustments after childbirth and egalitarian attitudes with work adjustments of both partners (e.g. Kaufman and Bernhardt, 2014).

This present analysis goes beyond the scope of these unsurprising findings, however. It shows that gender ideologies play an important role, but that they have a different impact on women's careers depending on the institutional and structural conditions in which they unfold. Comparing couples who built their careers in different conditions and in different institutional settings highlights the different nuances in which these ideologies operate and how they interact with structural factors. The specific context of a Central Eastern European country, in which a radical change occurred between two generations (not only in terms of research work but also in terms of a significant worsening of conditions for combining work and care), allows us to study mutual interactions among the effects of structural and institutional barriers, gender ideologies and the ways these are mirrored in women's professional careers in science and research.

An inter-generational comparison of the traditional partnerships emphasises that in addition to the gender ideology the organization of research institutions and conditions for combining work and care play a major role. Women researchers of the older generation – who had children at a time when there was no pressure on academic performance, when an interruption of a career as a result

of parenthood did not represent an insurmountable problem in building a work position in science because of the then generally limited extent of work flexibility (Linková and Červinková, 2013: 23), and when childcare facilities were generally available – managed to cope with the handicap of the traditional partnership much better than young women scientists of the current generation. Women researchers of the older generation living in traditional partnerships were often able to attain similar and sometimes even higher levels of seniority than their partners. This stands in sharp contrast to the younger generations of traditional couples who usually described the greatest increase in the gap between his and her career advancement associated with parenthood. At the same time, it appears that egalitarian couples managed to compensate for the negative impact of unsuitable conditions for combining work and parenthood, while these negative effects worsened for the traditional couples. The interaction between gender ideology and structural and institutional conditions thus takes various forms and has various effects.

The analysis highlights important sources of gender inequalities in the research profession and a possible explanation for why the proportion of women in Czech science is decreasing. As it transpired, it is necessary to consider both the institutional settings and the discrepancy between the demands of the labour market and the conditions for combining work and care (specifically the unsuitable conditions for childcare, work–life balance and changes in the research profession) as well as how gender roles are organized in dual career couples. This is why institutional actions to advance gender equality in research and developing gender-sensitive practices and procedures are so important, because such actions can mitigate against the gender conservatism at individual level which can be witnessed today in the Czech cultural context.

Declaration of Conflicting Interest

The author declares that there are no conflicts of interest.

Notes

1. That is why new parental leave reform started to be termed 'multispeed'.
2. The support for motherhood and parenthood currently most often takes the following form: approximately one month before and six months after childbirth a woman receives maternity support (*peněžitá pomoc v mateřství*), corresponding to approximately 70% of her previous average salary, which is covered by social insurance. This support is reserved primarily for women in order to cover the period of recovery of their health after childbirth, breast-feeding and intensive care for a new-born child. It can also be collected by fathers, starting six weeks after childbirth. It is provided only to parents who have paid sickness insurance. After six months, the caring parent (usually the mother) starts receiving parental allowance, the amount of which depends on the duration for which it is paid. In total, a parent is entitled to a total amount of CZK 220,000 (approximately €8140), paid out until the child's fourth birthday. In the most common, 3-year leave, the monthly amount of this contribution is CZK 7600 (approximately €281), which represents approximately 29% of the average monthly wage in the Czech Republic in 2015.
3. Pseudonyms are used to identify interviewees throughout, to preserve their anonymity.
4. Independent and relatively stable research position (position not linked exclusively to the research grant).
5. Senior researcher = research group leader.

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Appendix

Table 1. Details of the interviewees

Pseudonyms (F, and M)	Age (F, M)	Family status	Family situation	Work position (F; M)	Work load (F; M)	Domain (F; M)	Type of partnership*
Alena and Alexandr	36, 57	Unmarried cohabitation	One child aged three	Postdoc fellow; researcher[4]	Part-time; full time	Humanities (both)	E
Cecilie and Cyril	72, 75	Married	Two adult children aged 43 and 42	Full professor, Former senior researcher[5]	Both retired and working part-time	Natural/medical sciences; Social sciences	T
Věra and Vladimír	26, 27	Married	One child aged six months	Doctoral fellows	On parental leave and working part-time; full-time	Natural sciences (both)	E
Hana and Hanuš	27, 33	Married	One child aged two months	Doctoral fellow; Associated professor	On parental leave; full-time	Natural sciences (both)	T
Dita and Dalibor	28, 32	Married	Expecting first child	Postdoc fellows	Both working full time	Natural/ medical sciences (both)	E
Silvie and Samuel	65, 64	Married	Two adult children aged 32 and 39	Assistant professor; full professor	Both retired	Natural sciences (both)	T
Iva and Ivo	33, 33	Married	Two children aged two and one year	Assistant professors	On parental leave and working part-time; working full-time	Natural sciences (both)	T
Lucie and Libor	45, 46	Married	Two children aged 20 and nine years	Researcher; Associate professor	Working full-time (both)	Natural sciences (both)	T
Jiřina and Jiří	37, 37	Married	Three children aged 11, 10 and five	Researcher; associate professor	Working full-time (both)	Natural sciences (both)	T
Eva and Erik	68, 67	Married	Two adult children aged 42 and 35	Assistant professor; Full professor	Working full-time (both)	Natural/medical sciences (both)	T
Marie and Matěj	34, 33	Married	Expecting first child	Assistant professor; Associate professor	Working full-time (both)	Technical sciences (both)	E
Kristýna and Karel	62, 62	Married	Two adult children aged 36 and 30	Full professors	Working full-time (both)	Natural sciences (both)	T
Pavla and Petr	33, 38	Married	Twins aged two years	Postdoc fellow; researcher	On parental leave; working full-time	Natural sciences (both)	T
Nina and Norbert	65, 69	Married	Two adult children aged 36 and 29	Full-professors	Working full-time (both)	Natural/medical sciences (both)	E
Bořek and Běta	38, 33	Married	One child aged eight	Associate professor; assistant professor	Working full-time (both)	Humanities (both)	E
Olga and Ondřej	36, 36	Married	Two children aged six and four	Researcher; senior researcher	Working part-time; working full-time	Natural sciences (both)	T

*(E = egalitarian, T = traditional)

Female academic leadership in the post-Soviet context

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Abstract

Using a qualitative interview approach, this study analyzes the experiences of women in academic leadership positions in post-Soviet Kazakhstan. An exploration of the extent of the relevance of Western research on female academic leadership is used to explain the experiences of female leaders in Kazakhstan. The results of the study are consistent with the results of prior studies conducted in other countries and can be largely explained by existing theories. One distinctive feature of the experiences of female leaders in Kazakhstan is the superimposition of three dominant cultures – traditional, Soviet, and Westernized neo-liberal, which impose multiple conflicting expectations. Kazakhstani women are obliged to maintain multiple identities when communicating with their colleagues, superiors and extended family members. The exact outcome of the work–life balance negotiation depends, among other factors, on the type of ownership and geographic region of a university. The study also reveals that neo-institutional theory, not conventionally used in the analysis of female leadership in academia in the West, may be particularly relevant for explaining female experiences in transitional and developing contexts; specifically, in explaining the constraints imposed by informal policy networks and corruption.

Keywords

Female leadership, gendered organization, women leaders in higher education, work–life balance

Introduction

Higher education is believed to be a gender-friendly working environment because of the relative flexibility of working hours (Bain and Cummings, 2000), and the options of greater freedom and autonomy (Bailyn, 2003). However, universities still appear to be gendered (Townsend and Twombly, 2006). Existing traditional structures of the university, despite claims of neutrality

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(Acker, 1990; Eddy and Cox, 2008), continue to favor men (Jones and Taylor, 2012). Females are still under-represented in university leadership around the world (Aiston, 2014; Catalyst, 2015; Jones et al., 2015).

The situation in Kazakhstan is consistent with this pattern. In 2014, only 16 (14%) of 115 university presidents, and only 144 (31%) of 467 vice-rectors were females (Sagintayeva, 2015). Female under-representation was more pronounced in public universities. While in public universities 3 (9%) of 31 presidents were women, in private universities 7 (16%) of 57 presidents were women. The difference is greater at the level of vice-president, which indicates that women hit the 'glass ceiling' at lower levels in public universities in comparison with women employed in private providers. In public universities 36 (19%) of 190 vice-presidents are females, while in private universities 69 (43 %) of 158 vice-presidents are females.

To achieve greater gender equality in university leadership, it is important to understand better how females in academia progress towards leadership and what their experiences as leaders are. While many studies have recently been conducted on the topic (see, for example, Acker, 2012, 2014; Airini et al., 2011; Aiston, 2014; Morley, 2014; Morley and Crossouard, 2016; McNae and Vali, 2015; Obers, 2015; Wallace and Marchant, 2009), most of the prior research has been 'constructed, classified, and theorized from a white hegemonic perspective' (McNae and Vali, 2015: 289), which has led to homogenization, marginalization and silencing of women educational leaders from non-Western countries (Fitzgerald, 2006). More studies of female experiences as academic leaders in various cultural contexts are necessary to explain women's leadership experiences in non-Western contexts (Fitzgerald, 2006).

Kazakhstan presents an interesting case for comparative analysis because it has experienced, on the one hand, a rapid transition from a socialist society to a neoliberal value system with their respectively distinctive views about the social and professional roles of a woman, as well as about women and leadership; and, on the other hand, a simultaneous resurgence of traditional norms and gender expectations (Kandiyoti, 2007). Females find themselves in the context of conflicting societal norms and expectations about their roles in the family and at work. The study of the experiences of Kazakhstani female leaders would allow for the adjustment of existing Western research findings to the context of post-Soviet and transitional countries.

Background information on the position of females in Kazakhstani society and academia

Formerly a backyard colony of the Russian Empire, Kazakhstan underwent an impressive change on a grand scale with regard to female emancipation during the times of Soviet rule (Kandiyoti, 2007). Viewing the female as an important contributor to economic growth, the Soviet government used the gender equality argument to ensure broader participation of females in the labor force. The Soviet state guaranteed access to free and universal school education, to free medical care, and to publicly-subsidized childcare for families with children (Pascall and Manning, 2000). However, and importantly, even after more than 70 years of Soviet rule, females continued to be underpaid, underemployed as well as underrepresented in leadership when compared to males (Katz, 2001).

After gaining independence in 1991, Kazakhstan experienced economic decline, which was followed by an impressive period of economic growth due to oil and mineral ore extraction. Striving to create an internationally competitive economy under conditions of deficit of a highly qualified cadre, the government has started to view females not only as important participants of the labor force but also as important contributors in decision making. Hence, it actively pursues the

gender equality argument of the democratization agenda, which is largely promoted by international development agencies (Kandiyoti, 2007).

While the neoliberal reforms orient females to play an active role as economic players outside the family, the concurrent process of national identity formation leads to a revival of the pre-Soviet expectations about the role of a female in the family (Kandiyoti, 2007). Whereas the pre-colonial nomadic life of Kazakhs was based on the principles of gender equality, which was organically intertwined with a moderate version of Islam, the penetration of radical Islamic values during colonial times has introduced the male-centric view of the family which requires a woman to be subordinate to her husband and to be primarily responsible for care-providing (Kandiyoti, 2007). These traditional norms have re-emerged in modern-day Kazakhstan and co-exist in complex arrangements together with the views formed during the Soviet period and the Western-style values imposed by democratization and economic liberalization reforms. To the extent that the revived pre-Soviet social norms, developed under the influence of Islam and pre-colonial 18th century nomadic society, continue to exert influence on the life of the female, Kazakhstan is a very traditional society.

In terms of the higher education organizational context in Kazakhstan it should be noted that, unlike in many Western countries, the academic profession has been dominated by women in the Soviet Union. University faculty in the Soviet Union and, as a legacy, in modern Kazakhstan, have been predominantly teachers rather than researchers, with most research personnel being concentrated in the system of the Academy of Science laboratories and industrial enterprise research centers. The university faculty job has always been modestly paid and remains attractive to females mostly for the flexibility that it offers and the lack of comparable employment options elsewhere. At the same time, promotion to university leadership positions (such as Rector or Vice-Rector) was somewhat problematic for women in the Soviet Union, largely due to the political nature of the appointment, which involved close interaction with the headquarters of the Communist Party and KGB.

Review of the Western research on females in academic leadership

While there is extensive literature on the experiences of female leaders in various fields, including, most notably, business and public policy, this literature review is limited to articles in the field of higher education, which are more directly related to the topic of the study. In general, our review has revealed that most of the previous studies were based on data from Western countries (e.g., Acker, 2012, 2014; Airini et al., 2011; Sánchez-Moreno et al., 2015; Peterson, 2016; Read and Kehm, 2016; Savigny, 2014; Wallace and Marchant, 2009; Wallace and Wallin, 2015; Wilkinson, 2009). Moreover, their participants were frequently representatives of the white middle-class (Wilkinson, 2009). Only recently has the field been enriched with studies shedding light on the East Asian (e.g., McNae and Vali, 2015; Morley, 2014; Morley and Crossouard, 2016; Nguyen et al., 2012), the South African (e.g., Obers, 2015) and the Middle Eastern experiences (e.g., Arar and Oplatka, 2016; Morley, 2014; Samier, 2015). To our knowledge, no studies have yet been conducted on women in Central Asian academia.

It is important to note that most of the studies identified involved female participants who had already achieved leadership positions. While this type of sampling does not provide for obtaining valuable insights into barriers from females who failed to achieve leadership positions, the approach is justifiable because (1) it is difficult to identify females, who failed to become leaders despite their aspirations; and (2) even those females who achieved leadership positions had to overcome challenges and have something to say in this regard.

Acknowledging that there are many other approaches to classifying the existing body of literature, we identified the following key theoretical perspectives in the order of their emergence:

(1) Human capital theory;
(2) Psycho-social or gender–role theory;
(3) Gendered organization theory;
(4) Performative leadership theory; and
(5) Professionalization theory.

Human capital theory

The earliest explanations of the failure of females to advance to leadership positions were provided by the human capital theory, which attributed the inability of females to advance to their lower propensity to invest in intellectual capital (Naff, 1994; Hakim, 1996, as cited in Choi and Park, 2014). In the West, as women started to invest more in their education and training, the human capital theory became irrelevant (Choi and Park, 2014); however, the framework continues to be useful for developing countries where girls still have less access to education (Zafarullah, 2000; Bawa and Sanyare, 2013).

Gender role theory

The human capital theory cannot explain why females with the levels of education and experience identical to those of males have more difficulties in advancement to leadership. Eagly's (1987) gender–role theory provides one possible explanation with the idea of gendered division of labor and associated gender role expectations. From their early years women 'are exposed to persuasive messages that their lives should revolve around taking care of others and their career plans are somehow superimposed on this primary obligation' (Betz, 1994: 298; Eagly and Carli, 2007). As a result of such early gender orientation, girls become less ambitious than boys, limiting themselves to traditional female occupations (Caceres-Rodrigues, 2013; Coogan and Chen, 2007).

Even grown-up females have reduced levels of motivation, self-esteem and career aspirations compared to men, in addition to avoidance of leadership responsibilities (e.g., Heilman et al., 1987; Lenney, 1977; Newman, 1993; Powell, 1993). When performing leadership responsibilities, they struggle with balancing family responsibilities and demanding responsibilities as an academic leader (Wilson et al. 2003; Luke, 2001; Beddoes and Pawley, 2013), especially in countries with a traditional male breadwinner/female care-giver model (Kim, 2008; Choi and Park, 2014). In addition, they are evaluated less favorably than males with regard to their leadership abilities (Heilman et al., 1989; Schein, 1973) and experience role-conflict and cognitive dissonance when performing leadership roles (Bass, 1990; Bayes and Newton, 1978).

Associated with the gender–role literature are studies which propose that women use different leadership styles to overcome role-incongruence. Earlier research on leadership-style differentiation has shown various results about the extent to which different genders exercise task-oriented or interpersonally-oriented leadership styles, and participative (democratic) or directive (autocratic) styles (Eagly and Johnson, 1990; Eagly et al., 2000; Van Engen, 2001; Wagner and Berger, 1997; Eagly and Karau, 2002). Later research indicated that women are more likely to use, and are more favorably perceived if they demonstrate, transformational style; whereas males favor, and are perceived as being better at, the transactional style of leadership (Eagly et al., 2003). A transformational leader is understood in the studies as one who 'acts as a role model by gaining the trust and

confidence of followers…by mentoring and empowering their followers' (Eagly et al., 2003: 570). Transactional leaders 'appeal to subordinates' self-interest by establishing exchange relationships with them,… by clarifying subordinates' responsibilities and rewarding them for meeting objectives' (Eagly et al., 2003: 571).

Gendered organization theory

Studies using gendered organization theory (Acker, 1990; Aiston, 2014; Bain and Cummings, 2000; Jones et al., 2015; Luke, 2001, 2002; Morley, 1999; Stivers, 2002) claim that 'a manager is located in an organization that typically has a structure (such as a hierarchy of positions or a gendered division of labor), as well as a culture (a 'way of life')' (Acker, 2012: 412), which historically favors males. In most societies, top positions in organizational hierarchies are occupied by males who often act as 'gatekeepers' to career advancement (Aiston, 2014). According to Bain and Cummings (2000), the 'old boys' club' promotes the male-friendly rules and becomes the principal mechanism of decision-making processes at the university (Luke, 2001). In addition, masculine organizational culture keeps women out of 'informal networks of male bonding and information sharing' (Luke, 2001: 58).

Women leaders confront the negative perceptions of female and male colleagues, as well as of superiors, of women's achievements. In many countries, male colleagues regard female promotion as a threat and do not feel comfortable having to take orders from females, perceiving women as less capable both physically and mentally (Choi and Park, 2014). In addition, leadership in academia is often associated with masculine traits such as self-confidence, independence and ambition (Madera et al., 2009). Those female leaders who seem to possess these traits are often seen as 'difficult' and 'unfeminine' (Luke, 2001) and this perception also hinders women from being promoted to top positions.

Performative leadership theory

A more recent performative leadership theory, which emerged in the 1980s, criticizes earlier approaches to the analysis of gender and education, which viewed woman as a unitary category, largely reflecting the identity of white middle-class girls and women (Acker, 2002). Recent studies in gender and education have been concerned with differences and subjective experiences shaped by intersections of biological sex and socially constructed gender, race, socio-economic background, and so on (Fuller, 2014: 321). They draw on a post-structuralist perspective, which views gender as a fluid category, which is socially constructed and performed, rather than as a binary sex category, and which is pre-determined by nature (Raphael Reed, 2001; Fuller, 2013, 2014).

Some of the important insights in performative leadership theory include the concepts of gender heteroglossia (Francis, 2010). Bakhtin (1981) used the term 'monoglossia' to refer to 'forms of language reflecting the interests of dominant social groups' and 'heteroglossia' to mean 'the many potentially contradictory and subversive ways language is used at the micro-level' (Acker, 2012: 414). Francis (2010) indicated that while society was largely influenced by the dominant monoglossic interpretation of gender difference, which draws the line between two genders, consistent with two biological sexes, there are many examples of gender heteroglossia whereby individuals may assume not only gender-appropriate characteristics and behaviors but also, in some circumstances, the characteristics of a gender which is not consistent with their biological sex, such as masculine females and feminine males.

The key idea about female academic leadership that emerged from the performative leadership theory is that in the same way as gender is performed, leadership is also performative (Acker,

2012). Female leaders may assume a monoglossic façade, enacting 'traditional femininity', but beneath the surface may be doing 'translanguaging' by 'drawing on a combination of "masculine" and "feminine" behaviors and by switching from one identity to another' (Fuller, 2014: 324). This concept is very relevant in explaining strategies that females use to overcome challenges in leadership.

Professionalization theory

Most recently, Blackmore (2014) attempted to explain challenges to females' advancement to leadership from the point of view of professionalization theory. Blackmore (2014) argued that academic capitalism has introduced major changes into the academic profession, has resulted in an emphasis on quality and accountability and has expanded all types of professional responsibilities – those related to teaching, research and service. This expansion of responsibilities has led to a division of academic labor and the emergence of separate career paths – those of a teacher, of a researcher, and of an administrator – as well as to greater reliance on part-time academics. The de-professionalization of an academic career has occurred with the concurrent professionalization of academic management (Witchurch and Gordon, 2011).

Blackmore (2014) pointed out that the increasing pressures of the profession have discouraged some women to pursue the academic profession altogether or have marginalized them to part-time or assistant/associate level positions. These developments have excluded many potential female leaders from the leadership pool (Blackmore, 2014: 90). In addition, the knowledge economy's emphasis on innovation and technology has made research and technology-related administrative positions more attainable for faculty specializing in natural sciences and engineering (Blackmore, 2014). Given that females are under-represented in science and engineering, they are now increasingly under-represented in top management. Meanwhile, accountability and quality pressures have multiplied lower-level, seemingly dead-end administrative positions (associate deans, associate chairs, project managers, etc), which are frequently assigned to females.

Some frequently used metaphors in describing female leaders' experiences

Several metaphors are used in earlier research to describe the process of female advancement to leadership. The most powerful of them is the concept of 'the glass ceiling' (Bain and Cummings, 2000; Connell, 2006), which describes invisible barriers to women's advancement to top level positions in academia, when they have already achieved middle-management positions. Another related metaphor is that of the 'sticky floor', which is used as an explanation for why women are not promoted to the top levels of an organizational hierarchy – that they have less access to institutional resources and growth opportunities at the beginning of their careers (Tesch and Nattinger, 1997). The 'glass cliff' metaphor (Ryan and Haslam, 2005) refers to the inability of females to advance to leadership positions because they are disproportionately assigned to unpopular and precarious management areas associated with unrewarding organizational tasks and an increased risk of negative consequences.

This section has provided a brief overview of the main theories used to explain the experiences of women in academic leadership. Whilst the review revealed the presence of a wealth of such theories, most of the theories were developed using data from participants in the West. A combination of these theories will be used in this paper to explore the extent to which they are relevant in explaining female experiences in Kazakhstan.

Method

To answer the research question we used a qualitative approach which stresses the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry (Denzin and Lincoln, 2000). The main method of data collection using this approach was semi-structured interviews conducted face-to-face or by Skype. The interviews were conducted with the consent of the participants, lasted an hour, were administered by two female interviewees at a time and place convenient to the participant and, with the participant's permission, were tape-recorded. The interview questionnaire included questions about how the participant became a leader, how she understood the advantages and disadvantages of being a female leader, how her leadership style compared with that of males, what kind of challenges and opportunities she faced as a female leader, how she balanced her family–work demands and what kind of strategies she used to achieve success.

The study utilized maximal variation sampling, which provided for the achievement of a greater variation in the experiences of the participants − 13 female academic leaders. Such a variation was expected to generate a more detailed and broader-based understanding of the central phenomenon – the experiences of female academic leaders. The participants were varied according to the following characteristics: (1) age; (2) marital and parental status; (3) ethnicity; (4) type of institutional ownership; (5) geographic location of the participant; (6) level of leadership occupied; (7) disciplinary affiliation; and (8) leadership and higher education experience.

To select participants, we identified two institutions in each of the four regions across Kazakhstan which provided profiles and contact information of employees on their websites. The list of potential participants (females occupying leadership positions) from eight institutions was then created from information on the websites. A letter of invitation was sent to the individuals on the list explaining the purpose and the process of the study and inviting them to participate in an interview. The final participants were selected from the list of volunteers after an additional background search using the Internet and clarifying emails. The list was created in a way that allowed for achieving maximum variability in terms of the pre-defined characteristics. Table 1 provides a summary of demographic characteristics of the participants.

Results

The results of our study are presented in this section on the basis of six main themes:

(1) A woman's pathway to academic leadership;
(2) A woman's experience of leadership;
(3) Women's perceptions of societal expectations and strategies to meet them;
(4) Organizational influences on the variation in female leaders' experiences; and
(5) Institutional factors affecting female experience.

A woman's pathway to academic leadership

Our participants' accounts of their pathways to academic leadership are best interpreted using the frame of gender–role theory (Eagly, 1987). The challenges that females face on their way to leadership are mostly related to the conflict between societal expectations about professional and family roles. Like women in other countries, females in Kazakhstan seem to lack aspirations for leadership, do not strategize their leadership career development, and find themselves in leadership positions by accident, frequently being forced into this position by their superiors.

Table 1. Demographic characteristics of the study participants.

Position	Type of ownership	Ethnicity	Region	Age	Marital status	Number of children	Years in higher education	Years in leadership	Code
Dean	Private	Kazakh	South	46	Married	1	26	18	B
Head of Department	Private	Kazakh	North	36	Single	1	15	10	D
Vice Rector	Private	Kazakh	North	41	Single	3	11	1	K
Head of Department	Private	Tatar	North	30	Single	0	7	6	L
Head of Department	Public	Kazakh	East	45	Married	3	20	9	A
Head of International Office	Public	Kazakh	East	49	Married	2	20	2	C
Dean	Public	Kazakh	South	53	Married	3	30	25	E
Head of Department	Public	Kazakh	South	40	Married	3	17	2	I
Head of Department	Public	Russian	South	46	Married	1	14	3	M
Dean	Quasi-private*	Kazakh	North	59	Married	2	30	25	F
Vice Rector	Private	Russian	South	50	Married	3	7	7	G
Vice Rector	Private	Russian	North	42	Married	1	20	17	H
Director of Academy	Private	Kazakh	South	30	Single	0	4	4	J

*This is a university which is legally private, but is funded 100% by the government, while exercising a high degree of autonomy

A dean of a quasi-private university in Northern Kazakhstan, Participant J, is very representative of many women in terms of lacking leadership aspirations and self-confidence to be considered for promotion:

> I do not want to be a rector. You have to be able to handle many things at a time as a rector. … I cannot do this. I am afraid of responsibility for the whole university.

A 45-year-old head of department from a public university, Participant F, described how she became a leader against her will:

> I did not want to be a dean, but the rector wanted to appoint me to the position… I was crying because I thought I was not ready – I had not been even a chair before that. I said the reason I did not want the position was because I had two little kids. The School of Education at the time offered only programs in primary and preschool education. The rector said: 'You will just learn all the problems of preschool education from your kids'.

Younger females are expected to start a family and have children before the age of 30. Hence, participants around that age reported that they sometimes feel discriminated against due to the employer's fear that she may leave the workplace for pregnancy and childcare leave soon after promotion:

> Some people would say: 'Why are you taking her? She is almost 26 years old. She will soon get married and will go on a pregnancy leave. She will not be working and you will have to employ a replacement. She may never come back after having a child'. (Participant J)

An older woman without a husband and children is perceived as having a lower level of emotional stability, and lacking the ability both to understand subordinates' needs and to prioritize and manage their time. Some participants reported that they themselves would never promote a single childless female over thirty because

> …she becomes bitchy if she does not perform her primary caretaking role, they envy other women. (Participant B)

When a woman has young children she is less likely to be offered a promotion and is more likely to decline the offer because combining childcare and leadership responsibilities is viewed as very difficult at that age. This is what Participant C said about her decision to decline a promotion early in her career:

> I was offered this position before, but I refused as I thought that I need to spend more time with my children. The role of a wife and a mother was a priority for me.

For most participants, higher level leadership positions became possible after their children reached middle and high school levels:

> I got this job offer and I had some time to think. I thought that my children are grown ups and now I am a mature person. I have realized some essential programs of my life, that's why I agreed. Before that I needed more time to take care of my children and that was my priority. (Participant C)

A woman's experience of leadership

Gender–role theory is also very useful in understanding some of the challenges that females experience when performing leadership responsibilities as compared to males. Gender stereotypes about female characteristics and leadership abilities explain many of the hurdles that females face as academic leaders.

Participants of the study uniformly reported that they were assigned more work than males and had to accept extra responsibilities in order to be perceived as being as productive as males. Women also cover up for underperforming males because there is a belief that gender balance is important for the educational process and that a few available males must be cherished and 'kept for decorative purposes' (Participant G). Participant A made a joke in this regard:

> We have two males in our department, who are not willing to do their share of paperwork. So, I said to my female colleagues: 'ladies, these are the only gentlemen in our department, let's carry them in our arms'.

Many participants of the study noted that females tend to be more caring in their approach to leadership as compared to males, who are more impersonal and hands-off. According to Participant L, females

> …treat their colleagues as a family, are concerned about the well-being of the employees, and take into consideration challenges in personal or family life in setting expectations, assigning tasks, and in evaluating performance. (Participant L)

They are also 'more likely to provide guidance and advice to subordinates' (Participant B).

The caring leadership style seems to be less common among female leaders in top management, in male-dominated disciplines, and in circumstances with poor advancement opportunities. This finding is predicted by the gendered organization theory. It seems that fiercer competition with males in organizational structures that favor males makes females switch from a transformational to a transactional leadership style. In addition, women become less collaborative with other females and are reported to be more likely 'to get involved in intrigues' (Participant K). Females in male-dominated disciplines need to adopt a more male-like leadership style in order to succeed in tough competition with males. A 30-year leader, Participant D, who is the head of a department, mentioned that she played football with other male deans on the weekends and this allowed her to become a member of the 'guys' club'.

Women's perceptions of societal expectations and strategies to meet them

Conflicting societal expectations were a salient theme in the interviews with female leaders. Three sets of expectations were mentioned directly or assumed by the participants: those associated with traditional society and Islam, those associated with the Soviet society, and those associated with the 'neoliberal West'.

Traditional society puts family interests above the interests of an individual and assigns distinct, mutually exclusive and non-exchangeable roles to the husband and wife in the family. Males are believed to be physically superior to females and are perceived as heads of the family. They play the role of the primary earner and are expected to support their wives and children. The primary role of a female is care-giving for her children and spouse. The role cannot be delegated or shared with anyone else: only a mother is believed to be capable of providing appropriate emotional support for her children. Working outside the house is viewed as abandonment of the primary care-providing responsibility. Traditional expectations are often attributed to elders in the extended family, as well as to mothers- and fathers-in-law.

The set of expectations which was imposed by the Soviet ideology is more liberal with regard to the extent to which a female can participate in the labor force. A woman is encouraged to work. However, she is not expected and, in fact, is discouraged from earning as much as her husband because this is viewed as being destructive with regard to the masculinity of a man. She is still viewed as 'a weak gender', whose primary role is caring for her husband and family. Delegation of child-care responsibilities is permitted, to either another female (for instance, grandmother, sister or friend) or to daycare. Soviet-values are often attributed to older and senior level male and female employees of public universities, and to relatives who were educated and employed in the Soviet Union.

Western society is believed to impose a new set of norms which are perceived as threatening to the much cherished family-orientation of traditional society. In the understanding of Kazakhstani females, Western women value career more than family and the interests of their husbands. The female ability to advance in a career is attributed to the willingness of males to abandon their primary earning responsibility and to accept the role of care-provider. The unnatural distribution of family responsibilities was viewed as contributing to

> …a high rate of divorce, failures in child upbringing resulting in a high suicide rate, school-shootings, and disrespect to the elderly and the authority, as well as to the overall dissipation of the family as a social institution. (Participant D)

These values are attributed to the younger generation of highly ambitious males and females.

These conflicting societal expectations impose a great deal of stress on women in leadership positions. On the one hand, under the influence of neoliberal ideology, they feel pressured to work, to earn good salaries, and to demonstrate career progression. They view themselves as being as

capable in leadership as males and attribute failure to advance to personal incapacities rather than to societal barriers. At the same time, all the women interviewed continue to be influenced by the traditional society belief in the primary role of the female as care-provider. They view their role of mother as being more important than the role of leader and push themselves to perform equally in both leadership and motherhood roles.

Peers, colleagues, superiors, spouses and/or extended family members may hold any of the described set of beliefs and a woman has to satisfy all of them simultaneously. How Kazakhstani females meet these expectations is very consistent with the predictions of performative leadership theory. Some participants stated that they perform differently at work to when they return home. They have to act as progressive and aggressive leaders at work, where they have to be respected by male colleagues; but they have to assume a soft and subordinate position at home,

> removing her make-up, replacing pants [trousers] with a skirt, and covering her modern haircut with a head scarf, as they are patiently and silently serving endless rounds of tea to her husband and his relatives. (Participant L)

Organizational influences on female experiences

Type and location of the university. Our analysis of the interviews revealed a differentiation in the ways females balanced their work and family lives in their experiences as leaders across university types and geographic regions in Kazakhstan.

First, the environment in private universities is more neoliberal in orientation, as compared to the environment of public universities. To be able to survive in the competitive market private universities are 'more concerned about profit and quality and are interested in promoting talented employees regardless of their gender' (Participant G). Meanwhile, in publicly-funded universities, rectors are appointed by the President and there is a greater incidence of protectionism. As a result, females in such universities find themselves stuck in lower-level academic positions, where they are overloaded with bureaucratic responsibilities which make it more difficult to balance work and family lives. Males in public university administrations are still 'a rare species' and they are frequently favored over females in selection for and promotion to leadership positions. The lack of advancement opportunities makes the relationships among females in the organizations less collegial and less mutually supportive.

Second, participants believed that the southern and western regions of the country, as well as regions located on the periphery, tend to be more traditional in terms of gender expectations. In these regions, Islamic and pre-colonial nomadic cultural norms have experienced greater revival. This has made female advancement to and experiences in leadership more problematic because it has increased the pressure from the family to be a full-time mother, and has made female advancement less tolerated in male-dominated organizations.

Gendered division of labor. Organizational factors affect female experiences in leadership in another important way. In Kazakhstani academia there seems to be division of labor between male and female leaders. The responsibilities of a department chair or their deputies tend to be transactional, oriented to the internal day-to-day operation of the university. This type of position requires constant interaction with government agencies in terms of reporting and producing paperwork. As Participant B noted:

> We have to file a huge amount of documentation for the Ministry. Every day we have to draft 5–6 letters and each of them has to be completed urgently. In addition to that, we need to send official correspondence to the administration of the city and the Department of Youth Policy. You are turning into a robot, which is stuck processing correspondence.

Women are perceived as being better at these positions due to their diligence and detail-orientation and they comprise a majority as chairs and deputies. Meanwhile, these positions do not involve a significant pay differential in comparison with being a member of faculty, while requiring long working hours, limiting opportunities for research, and bringing a high potential to become involved in conflict with colleagues.

At the top of the promotion ladder is the position of rector, which is strategic in orientation. The key task of the President is to secure funding and political support for the institution. Participant G, who is a dean at a public university, observed that such a position is viewed as suiting males better, because they are 'better strategic and global thinkers', who are not 'subject to the influence of emotions' and who are 'more appropriate as a representative of the organization in external circles'.

In general, the findings described in this subsection are very consistent with the predictions of professionalization theory (Blackmore, 2014). As in many other places, in Kazakhstan the work of academic leaders at the lower levels has become more bureaucratized and offers fewer opportunities for combining teaching, scholarly and administrative responsibilities, while the work of academic leaders at higher levels has become mostly managerial and requires external management experiences. Female academic leaders seem to be unable to overcome 'the glass cliff', being assigned to seemingly dead-end administrative positions.

Institutional factors affecting female experience

A finding of the study, which was not predictable from the available literature, was related to the influence of informal institutions on female leaders' experiences. Many participants pointed to the 'team-approach to leadership' and corruption as the main barriers to their advancement. In Kazakhstan the position of a university rector is very important from the point of view of national-level politics. Having experience as a successful rector increases the opportunities for being promoted to a national-level decision-making position and becoming a part of the President's team. Individuals are appointed to be rectors of public universities by the President for testing purposes and their performance is carefully observed. Rectors do not perform their responsibilities alone. They start and leave the position with their teams, which frequently include most of the vice-rectors and heads of key departments at the university. As a result the top positions at the universities are not easily attainable for outsiders. It is possible to be promoted, to become a member of a rector's team, but such an appointment assumes a long-term commitment to the team versus the institution and academia in general. An individual should be ready to move with the team to another appointment, including an appointment in another city and outside academia. In addition, top level positons are associated with the necessity to engage in corruption and higher risks of losing jobs and freedom in case of exposure. Few females are willing to take these risks and to sacrifice the career of their spouses, as well as the well-being of their children, in order to commit to a team: thus they have few opportunities to achieve promotion to top level academic positions.

The available Western theories explaining the experiences of female academic leaders do not account for the importance of the informal institutional influences. They tend to focus on individual socio-psychological and organizational levels. While professionalization theory takes an institutional stance in explaining the influence of profession as a supra-organizational structure, it does not explain the role of informal institutional norms, including those regulating nepotism and corruption, as well as operation of informal policy networks. Meanwhile, such structures are very influential in the contexts of developing and transitional economies. Neo-institutional theory (e.g., Blom-Hansen, 1997; DiMaggio and Powell, 1991) provides a good framework for analyzing the influence of such inter- and supra-organizational structures and might be considered as a framework for researchers of female experiences in academic leadership. While this framework is

increasingly used by feminist political scientists under the name of feminist institutionalism (eg.: Krook and Mackay, 2011; Kenny 2007), it has not been actively used in the studies of female academic leaders.

Discussion

The purpose of the study was to explore how females advance to and perform in academic leadership positions in Kazakhstan and to test the relevance of Western theories in explaining their experiences in the post-Soviet context. Most of the results of the qualitative study are consistent with the findings of studies conducted in other contexts and can be interpreted using the theories, models and concepts discovered from the analysis of international experiences.

The experiences of female leaders in Kazakhstan are, to a large extent, similar to the experiences of females in other countries. Two features make the experiences distinctive, however. First, the transitional context puts women under pressure of more numerous and conflicting social expectations than can be expected in the case of a female representing the majority in a relatively stabilized Western society. In Kazakhstan, a woman is trapped in the overlap of three co-existing dominant cultures – the revived traditional, the strongly-persisting Soviet, and the increasingly influential Western. Under these circumstances females have both more challenges and more opportunities as leaders. Second, unlike females in Western societies, female experiences in Kazakhstani academia are influenced much more by informal institutional structures, which underlie corruption, nepotism and the operation of informal policy networks. These structures significantly limit female advancement opportunities.

Existing Western theories are able to explain most of the experiences of female leaders in Kazakhstan. Gender–role theory helps to explain why the 'sticky floor', or a set of barriers, inhibits the launch of a leadership career for a female. Our findings clearly show that younger females in Kazakhstani academia lack aspirations for leadership, have a low level of confidence, and are afraid of responsibility. The results of the study also reveal that females experience role-incongruity when performing leadership responsibilities and find it hard to balance their work and life. As with women in academia in many other countries (see, for example, Thompson and Day, 1998; Wilson, 2003; Luke, 2001; Beddoes and Pawley, 2014), Kazakhstani women sacrifice more and struggle more than their male colleagues because of the need to perform the dual roles of care-provider at home and professional academic employee.

Gendered organization theory helps to explain the external barriers, which create the 'glass ceiling' and the 'glass cliff' effects, whereby females fail to move above a certain leadership level in academic organizations due to prohibitive social norms and expectations, masculine stereotypes about leadership and typical characteristics of females, as well as gendered promotion practices. In many other cultures, females are stereotypically viewed as being helpful, kind, sympathetic and sensitive (Eagly and Carli, 2007) and face a 'psychological barrier to women's choice, performance and persistence in career decision making' (Sullivan and Mahalik, 2000: 55). The results of this study are very similar: women in Kazakhstan are also stereotyped as caring, emotional and more diligent. As a result they strive to pursue and are frequently assigned to positions at a lower level, associated with a lower likelihood of further advancement.

Some of the experiences of female leaders revealed in the study can be interpreted from the point of view of performative leadership theory (Reed, 2001; Fuller, 2013, 2014; Acker, 2012). When faced with multiple contradictory social expectations, females use translanguaging (Fuller, 2014), displaying different socially expected behaviors in a variety of work and family settings depending on the social expectations imposed on them by the 'audience'. They can be submissive, caring and empathetic at home, while being authoritative and rational at work.

Professionalization theory (Blackmore, 2014) helped to reveal the existence of division of academic labor among different genders in Kazakhstan, and this explained the lack of females in top level academic leadership positions. Kazakhstani females tend to be over-represented in the lower-level positions, of academic chairs and their deputies, which are associated with heavy work loads and few opportunities for career advancement. Meanwhile, they experience difficulties in accessing top level vice-rector and rector positions which require greater political acumen and strategic thinking, and which are stereotypically viewed as being more greatly represented in males.

However, the existing theories fall short in providing an explanation of the role of informal institutional structures in female promotion to leadership in Kazakhstan. For example, none of the existing theories can explain why corruption, nepotism and the 'team approach to leadership' hamper female advancement to top level academic leadership positions. However, neo-institutional theory, including feminist neo-institutionalism, can be used to frame the influence of the phenomena on female advancement and it is recommended that it should be incorporated in the analysis of female experiences as academic leaders in other developing and transitional contexts.

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Testing the concept of academic housework in a European setting: Part of academic career-making or gendered barrier to the top?

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Abstract

In the labour market women's jobs have frequently been conceptually and literally tied to housework and hence thought of as unskilled and therefore undervalued. Although academic institutions have undergone changes, the fact that women still carry the main responsibility for domestic and caring tasks continues to follow them into the academic work environment. In this explorative study we focus on the gendered aspects of undervalued work in academia by examining how academic housework manifests itself in different academic contexts and how early career academics in six European countries contend with it. We will link the undervalued academic work to housework in a double sense. Firstly, we will discuss how domestic housework affects the working conditions of academic women and men differently in their early career. Secondly, we will approach academic work through the lenses of academic housework, hence making use of the notion of 'housework' in a transferred and more figurative meaning. The discussion is aimed at developing a new conceptual framework in the analysis of gendered academic careers. In this way the topic of academic housework, which seems to be accompanied by social taint, may become more easily discussable within the academic work environment.

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Introduction

The gendered division of labour has been explored by feminist scholars during previous decades, with some of the more recent research addressing the impact of neo-liberal influences, the restructuring of work and its gendered consequences (see Ferguson and Hennessy, 2010). In the 'era of global competition' this is also affecting modern academia with its emerging discourse on 'excellence', and it has consequences for the work conditions of women and men in academia, especially for those in their early career. In this study we explore the gendered notion of 'academic housework' in an attempt to grasp the gendered aspects and plausible consequences of undervalued work within academia. In the 1990s Sylvia Walby launched the idea of two different forms of gender regimes in her historical analysis of patriarchy, against which women's paid work can be analysed. In the 'private patriarchy', or domestic gender regime, that existed until industrialism, women were to a large extent excluded from paid work in the labour market. In the 'public patriarchy', or the public gender regime, women were allowed to enter paid work but in segregated, undervalued and less paid jobs (Walby, 1997). In the labour market women's jobs have frequently been conceptually and literally tied to housework and hence thought of as unskilled and therefore undervalued. This applies to female dominated jobs that are often seen as the extension of domestic work such as care work, nurturing, service or cleaning work, which are thought to be connected to women's innate capacities (Ferguson and Hennessy, 2010). In the following study we will focus on the gendered aspects of undervalued work in academia. On the one hand, while exploring the working conditions of early career academics, we fully acknowledge that the largely invisible housework chores tend to remain women's responsibility more than men's. On the other hand, we approach academic work through the lens of academic housework, hence making use of the idea of 'housework' in a transferred and more figurative meaning. Our discussion addresses how academic housework manifests itself in different European academic contexts and how early career academics contend with it, and aims at developing a new conceptual framework in the analysis of gendered academic careers.

The academic environment

Job openings within academia are relatively rare, and because of globalization, massification, commercialization and managerization (O'Connor, 2014), early career academics experience fierce competition when it comes to obtaining an academic post. Various studies show that social capital and informal networks play a crucial role during the academic selection process (e.g. Heijstra et al., 2016; Van den Brink and Benschop, 2012) in which more senior academics function as gatekeepers, protecting the exclusivity of their academic status group, by only granting access to a select few.

Early career academics tend to be determined and persistent in their aim to obtain a position in the academic status group, despite likely setbacks. Hochschild (2005) identified five coping strategies in order to deal with such setbacks. She identified workers as endurers, deferers, busy bees, delegators and resisters. While the experiences of early career academics depend on their work experience, informal networks and agency (Remmik et al., 2013), based on the findings of Heijstra et al. (2016) most early career academics can be classified as deferers. They approach their current situation as a temporary one, thereby justifying their narrow focus on life within academia.

The temporariness of the situation, as Hochschild (2005) points out, is rather flexible and can last an extensive time period. Others qualify as busy bees, seeing a challenge in whatever activity they undertake, despite the risk of hollowing themselves out. According to Hochschild, both deferrers and busy bees may be practising a covert form of emotional control management in which they suppress feelings and emotions. The downside, as indicated by Manley-Casimir et al. (2012) is that the price of belonging when entering the academic environment can be substantial in terms of expectations for institutional compliance and conformity. Hence particularly women and other marginalized groups may experience difficulties in negotiating their entrance to the profession. Moreover even if they enter successfully, women's secondary status in higher education is an ongoing theme in research. As early as 1964 Jessie Bernard theorized on women's position within universities. A decade later Dorothy Smith (1974) described the male sociologist theorizing as freed from bodily existence, by women taking care of the 'messiness' of the body, and how that effected knowledge production. In a bifurcated world the male sociologist lives in one part (the conceptual world) and female sociologists in both parts (the conceptual part and in the home/the body). His work is thus clean while hers is tainted, i.e. dirty. Numerous other works later followed this pioneering work (see e.g. Baker, 2014; Brooks, 1997; Sagaria, 2007) – repeatedly pointing towards masculine working culture. For instance the minimal requirements to achieve academic excellence, features that are generally related to male behaviour, are levelled up by extensive working hours and workload, total dedication, competitiveness, and few expressions of emotions. Earlier, Weber used the concept of work ethic in *The Protestant Ethic and the Spirit of Capitalism* (1930/2000) to refer to hard work as a means to improve life conditions, and individual responsibility (Miller et al., 2002). Traces of these notions can still be found in today's academic work ethic. Hard work is accompanied by symbolic capital and internal rewards such as intellect and status, which are perceived to improve life conditions to a larger extent than external rewards in the form of economic capital. Individual responsibility, appears through the ideology of meritocracy, in which hard-working academics are believed to be rewarded more by the system than their less productive colleagues.

Family responsibilities

As the academic work ethic requires full dedication to the academic profession this is especially challenging for early career academics who want to establish a career and family simultaneously as such conduct can be interpreted by gatekeepers as lack of academic dedication. In an American research institute, fathers who wanted to spend time with their family were penalized for this 'unconventional' behaviour by having their promotion delayed (Sallee, 2012). Family life however still seems to be affecting the academic career-making of women to a larger extent than that of men. For instance, a study on gender neutral tenure-clock-stopping policies for new parents, which are intended to especially support women that have larger caring responsibilities than men, revealed that fathers rather than mothers were benefitting from such policies. During the year that the tenure clock was put on hold, the men became more productive and published more often in higher ranked journals, while women in the same situation were much less able to do so (Antecol et al., 2016). Furthermore, women with young children have been found to be labelled as being less serious about their academic career (Ginther and Kahn, 2004), while young academic women on longer-than-average summer breaks, experienced negative academic career consequences because of this in Iceland. The career progress of men in similar situations however remained unaffected (Heijstra et al., 2015).

In the 1990s Davies (1989: 38) wrote that women's time at home becomes 'other's time'. A study that was done 20 years later by Rafnsdóttir and Heijstra (2013) among academics showed

that men were still more able than women to control their time at home and at work. In contrast to the men, the women were more likely to express the view that they were feeling like hamsters in wheels, running between work and family obligations, without having real control over their time.

Although flexible working hours and work autonomy can be helpful to academic parents when organizing their working day and fulfilling the ever-changing needs of family members, women more than men seem to be stuck in caring and domestic responsibilities because of this same flexibility. The gendered time use and flexible working hours reproduce traditional power relations between men and women and the gender segregated division in the home. While men are likely to reveal that they are 'assisting' in the household, some studies have found that not everyone experiences the division of the housework as unequal. For instance, a study by Pétursdóttir (2009) among Icelandic employees in various lines of work revealed that men actually perceived their share in domestic and caring tasks equal to that of their partners, even though in reality this was not the case. Pétursdóttir argued that the participants in her study had created a 'task division' that both partners were content with, and because of that they tended to perceive it as a gender equal situation.

Academic housework

While numerous studies on work–family balance have pointed out that work can easily flow into the private atmosphere, for instance by means of information and communication technologies (Heijstra and Rafnsdóttir, 2010), less attention has been paid to the fact that certain aspects of the private atmosphere can also spill into the work environment. In line with what Dorothy Smith (1974) has argued about men theoretically being freed from bodily existence while women bear that responsibility, we argue here that carrying the main responsibility for domestic and caring tasks follows women into their work environment, as the responsibility for such service tasks is not easily left behind at home. Referring also once more to Walby's different systems of patriarchy (1997) and the notion that women's jobs have been conceptually and literally tied to unskilled housework (Ferguson and Hennessy, 2010), it is not only within female dominated jobs that gender differences occur. Women tend to take on more undervalued chores in their workplaces and even in professional work environments, such as the academic environment. Despite its ideology of meritocracy, its focus on science, its strong work ethic and its emphasis on academic excellence, there are chores in the academic environment that are less rewarded than others. For instance, tasks relating to giving back to the community, administrative and committee work, gender equality initiatives and various teaching and research-related activities such as student interactions and the organization of conferences. Heijstra et al. (2016) point out that academic women in Iceland are supposed to participate in all kinds of committees in the name of gender equality, while there are also indications that women in academia are more likely to be part of confidential personal conversations than their male colleagues. In an online writing Green (2015), a female professor, reveals that she regularly gets requests from either colleagues or students to discuss their personal affairs. Green (a pseudonym) estimates that every three weeks she has someone crying in her office. Not only are such requests emotionally demanding and time consuming, but Misra et al. (2011) argue that emotional service work is invisible work which pulls female academics more than male academics away from research, as women tend to spend more time on service work and mentoring than men. Emotional service work therefore forms part of what has been referred to as natural chores of academia, which in a previous article (Heijstra et al., 2016) we have been referring to as 'academic housework'.

Our concept of academic housework bears resemblances to the early formulation by Hughes (1951) of dirty work. He explains how an occupation is best described as a bundle of different tasks where each task has a place on a prestige scale. Hughes maintains that in every bundle there is a

task or tasks that, based on their low prestige within a certain context, come to be defined as dirty work. He furthermore writes that: '[A] task that is "dirty work" can be more easily endured when it is part of a good role, a role that is full of rewards to one's self' (Hughes, 1951: 295). This could therefore well apply to the academic profession which generally is considered to be a prestigious profession. Moreover, based on one's status within the occupation, dirty work can be outsourced to others who have less status, but taking on such dirty work is not without risk as it can leave one socially tainted, thereby affecting one's relationship with members of the same occupation (Ashforth and Kreiner, 1999).

Other scholars have used the term 'academic housework' in a different theoretical context from what we intend to do here. Bauer (2002) used the term 'academic housework' in a discussion about the institutionalization of Women's Studies within US academia without defining the concept in detail. She uses 'academic housework' together with Hochschild's concept of the 'second shift' to illustrate the workload and uncompensated service work required from feminists to keep the subject of gender studies alive in academia, implying 'the nurturing, sustaining, fostering of students, a labor made "natural" because of their interest in furthering a Women's Studies agenda' (p. 246). In a similar vein Fitzgerald (2009) employed the concept to make sense of the situation of earlier generations' academic women in the masculine environment of the University of New Zealand. She uses the term in a literal sense by arguing that the establishment of the Department of Home Science constituted the space that women academics were given at their entry into the university. In this 'academic kitchen', New Zealand academic women taught highly feminized subjects such as nutrition, clothing and home management, and they were expected to 'engage in work that involved a level of maternal care for women students' (p. 25). In addition, Boughey (2007) mentions academic housework in a discussion on the conditions for black students in South Africa after Apartheid. Boughey maintains that efforts on behalf of academics in student support had similarities with 'what Grant and Knowles (2000: 84) term as "academic housework" because of its focus on "unrecorded and unrecognized pastoral care within universities"' (Boughey, 2007: 20). Notwithstanding valuable insights in the above discussion we develop the concept 'academic housework' in another direction. Up until now we have conceptualized academic housework as:

> all the academic service work within the institution that is performed by all academic staff, both women and men, but that receives little recognition within the process of academic career making or within the definition of academic excellence. (Heijstra et al., 2016)

In this exploratory research we will develop the concept of academic housework further, by utilizing the input from data collections from six European countries on this topic. Previous results have identified that early career academics are to a larger extent involved in academic housework than associate and full professors, as the latter are more likely to be able to redistribute such tasks to academics in more subordinate positions. The same study reveals that while women in Iceland are still under-represented in the highest academic positions, they frequently form the majority of academics within subordinate academic positions (Heijstra et al., 2016). It therefore seems important to obtain further insight into the experiences of early career academics with regard to academic housework and take gender into account. This article therefore revolves around the following research question:

> How does academic housework manifest itself in different European academic contexts, how do early academics contend with it, and is there a difference between men and women?

By working towards an answer to this question we intend to contribute to both the existing scientific literature as well as to the actual work conditions of academics. First of all, by raising awareness of

the concept of academic housework we intend to initiate a discussion on academic work: which aspects of the profession are valued within the academic system and for what reason, and which aspects remain undervalued and unseen? Active promotion of the concept within Icelandic academia in the past 12 months has overall been positive. Academics in various SSH (Social Sciences and Humanities) departments are found to have integrated the term into their conversations with women finding it empowering to connect their own experience to the concept of academic housework, while some of the men seem more concerned that the concept will put a taint onto their profession. In order to detach themselves from such a notion, some men have addressed academic housework as nitpicking; for instance, having to wipe out the whiteboard before starting class, became referred to as academic housework. Secondly, we like to raise awareness of the fact that even though the job descriptions of academics in various ranks may be very similar, some academic tasks tend to land disproportionally on the shoulders of certain academics and much less on others, due to gender regimes and the more subordinate position of early career academics. Thirdly, the concept of academic housework is an addition to the list of causes creating both leaky pipeline and glass-ceiling problems, but which so far has largely been ignored in the scientific literature. The sticky floor phenomena has been defined as the opposite of the glass ceiling phenomena (Kee, 2006) and refers to various aspects that keep women in the lowest ranks of the organizational hierarchy (Schueller-Weidekamm and Kautzky-Willer, 2012). Fourthly, by relying on comparative European data we are able to develop the concept of academic housework from different angles, thereby improving its trustworthiness and rigor (Merriam and Tisdell, 2015).

Methodology

For this article we rely on empirical data that were collected and analysed by scholars in Iceland, Belgium, the Netherlands, Italy, Slovenia and Switzerland as part of the GARCIA research project, Gendering the Academy and Research combating Career Instability and Asymmetries, that is supported by the 7th Framework Programme of the European Union. The project is concerned with gender equality in European universities and research centres, and is based on multiple-data collection methods including statistical data, secondary data, semi-structured interviews and focus groups.

The concept of academic housework was previously developed from the Icelandic data only, relying on 14 semi-structured interviews with eight female and six male scholars. The University of Iceland, which formed the venue for our main data collection, is an interesting scene to examine the applicability of the concept of academic housework, not in the least place because of the university's dedication to equality policies, and the country's defamilization policies (Lister, 1997: 173), and high level of gender equality as measured by the Global Gender Gap Report (Hausmann et al., 2015).

In addition to the Icelandic data in this explorative study we are relying on data from the partner countries to provide comparative and contrasting insights and to help conceptualize academic housework in more detail. Each partner country was responsible for a set of semi-structured interviews on the topic of gendering practices within the academic environment and the phenomenon of the leaky pipeline. Partners were given the autonomy to conduct semi-structured interviews in their own language or in English. Interviewees, both men and women, were selected by means of purposive sampling; they needed to be PhD holders, at the early stages of their (academic) career, and those that could be qualified as either stayers or movers with regard to the academic work environment. Preferably, they were working or had experience within the selected STEM (Science, Technology, Engineering and Mathematic) or SSH departments, although this did not always turn out to be possible due to small sample sizes. The Icelandic team, for instance, broadened its selection criteria to include other STEM and SSH departments within the selected academic institution

as well. Questions generally revolved around participants' everyday life experiences, their academic department, and professional and private biographical lifelines. Each partner country was guided by the same interview frame, but was free to add or leave out questions as they saw fit. Two questions were added to the overall interview frame at the request of the Icelandic team, one inquiring about salary and the other about academic housework: '*Do you think that you are (were) adequately paid for the work you do (did)?*' And: '*Are (were) you expected to be engaged in extra undervalued work?*' By adding these questions we attempt to flesh out the meaning of academic service that 'receives little recognition and holds low prestige' by explicitly spelling out the content and linking payments and undervalued work to each other. Scholars in the participating countries conducted the semi-structured interviews, recorded and transcribed them, and wrote an analysis in English on the main outcomes to these two interview questions. Each country's analysis is based on data from approximately 20–35 interviews. Subsequently the Icelandic partner thematically analyzed the six reports using Atlas.ti, version 1.0.2(68) research software, by focusing on common codes and themes as well as dissimilarities within the country reports. The themes that derived from this total analysis are discussed in the following section.

Exploring academic housework in various contexts

Interviewees within all countries could relate to the notion of undervalued tasks within academia, but saw such tasks not necessarily as a bad thing but rather as an integral part of the bundle of tasks of the academic profession. When asked what kind of tasks they had in mind, STEM interviewees emphasized in the first place research-orientated chores, like discussing and reviewing scientific articles, writing safety instructions for laboratories, administrative tasks that were related to international research projects, and the organization of alumni clubs, while SSH participants more frequently named tasks relating to teaching, such as the recruitment of students, supervision, student interactions, and the development of new teaching programmes. While giving lectures is not considered to be academic housework, as it, together with research activities, forms part of the academic job description, there are arguments available in both the Icelandic and Italian cases that could undermine this standpoint. First of all, in the Icelandic academic environment, senior academics can buy themselves out of lecturing but not out of research, while academics that are considered to be lacking in research productivity can be penalized for this behaviour by increasing their teaching load. Secondly, the Icelandic incentive system rewards a standard amount of points to teaching tasks, solidly based on whether or not the academic employee occupies a full-time position, while research activities are rewarded according to the amount of productivity. Moreover, the bundle of tasks given to adjuncts comprises largely of teaching responsibilities, and if they do complete research tasks, this is not always reflected in their salary. Sessional teaching is heavily underpaid but considered by gatekeepers as a way for newcomers to show their abilities. In the Italian situation there are cases where teaching is unpaid, but considered to provide valuable experience, and when it is paid for, the required multiple exam sessions are still excluded from terms of payment.

Regarding committee work, this tends to be valued as academic housework if the influence of the committee is limited and the level of prestige of the committee low. For example, in the Icelandic case it is considered less prestigious to be part of the teaching committee than of the science committee. However, there are also instances in which participants were referring to more highly valued committees, and approached membership of such committees as prestigious work that was reserved for permanent or high-ranked staff (the Netherlands). A similar opinion was shared by a female participant in the Icelandic sample who confessed she sometimes suffered from imposter syndrome when asked to take part in what she thought were prestigious committees.

'Extra work that pays off'

Overall, the interviewees were quite reluctant to take a negative stand towards academic household tasks, even if they were aware of the possible risk of being utilized as a cheap labor force. Newly tenured participants in the Belgian data thought of it as a sensitive subject and therefore '*tended to try to avoid answering directly to the undervalued work question*'. Instead, the participants were rather focusing on and anticipating that attending to academic housework was going to be beneficial for them in the long run. For instance, in the Netherlands some participants took a more Weberian stand by '*acknowledging that some tasks took more time than they were paid for, but they were trusting that in the long run this extra work would pay off*'. Within the Slovenian data there was discrepancy between whether academic housework chores would pay off in the long run or not. While the men at the STEM department were optimistic that these tasks would be beneficial, the women in the SSH department were more doubtful. A male participant explains: '*I don't believe I am exploited. In the long run, I can benefit from it*', while his male colleague went as far as arguing that he participated in academic household tasks with pleasure, thankful for the opportunities he was given. The women in the SSH department, however, were more concerned that the kind of academic housework that they were performing '*is not valued as "real" research*' and therefore will not count in terms of excellence measurements or promotion opportunities. In case of the Italian situation there is also acceptance with regard to academic housework, even if it is unpaid work. Making the unpaid work visible by adding it onto the CV, was considered to be important, as it was considered valuable experience with regard to future academic career-making.

When considering gender and the phenomena of the glass ceiling and the leaky pipeline, in particular, the perception of Slovenian women in the example, the results point to the various types of academic housework and the possibility that they are not all valued in a similar way. As the academic environment is a traditional male work environment with a male-orientated work ethic, the men in the different samples seem confident that their extra work will eventually pay off. The women also maintain this vision, although with less certainty. This is revealed not only in the Slovenian case but also shines through in feelings of imposter syndrome that some women experience when asked to participate in prestigious activities. Furthermore, in line with research on gender roles in Iceland (Gíslason, 2009), which revealed that men taking parental leave were received with admiration while women did not receive such praise but instead were met with suspicion if they took relatively short parental leave, it can be argued that participating in academic housework may have different outcomes for men and women. The participants were, overall, willing to attend to academic housework chores and invest valuable time into teaching and administration in order to create a positive image. Nevertheless while academic housework and relating social skills may be explained as an asset and a sign of full dedication to the profession on behalf of men, it seems plausible that similar efforts on behalf of women may stay unnoticed or will be explained as natural ability rather than as asset.

'Getting one's priorities straight'

Many of the participants within the various countries, especially the ones working in STEM departments, were aware that they could earn higher wages within the private sector. A Dutch male postdoc describes the situation in academia as: '*Shitty hours, shitty pay*' and was seriously considering quitting academia. Overall, academics were hesitant to complain or discuss their salary, although it does shine through in the Belgian data that some of the female participants were worried about their wages not being sufficient to make ends meet for them and their families, while this was not the case for men in comparable positions. It therefore seems that family responsibilities weigh

heavier on women than men in terms of the way that women are less comfortable putting their scientific interests ahead of their family needs, while the men trust that such investment will pay off in the long run. Participants in the other countries were either reasonably satisfied with their salary, or chose to emphasize the more intangible aspects of the profession instead. They argued that they were not in the profession because of the wages but because they valued features such as intellect, job satisfaction and autonomy to a higher extent. A Slovenian male participant even went as far as to argue that the intangible traits of the profession were so valuable to him that he felt he was actually being overpaid, despite his modest salary of €1700 a month. Maintaining and managing a positive identity is crucial when undertaking work that has been contextualized as dirty work, i.e. academic housework and what is at risk of being 'tainted by association' (Sanders-McDonagh, 2014: 243). A salient detail in this respect, however, is the finding that within the Belgian data, movers actually felt '*a higher work satisfaction level and greater personal freedom and well-being in their current jobs*'. This is remarkable as these are commonly assumed to be the rewards that follow a career in academia.

Regarding family life and sacrifices there was a remarkable difference to be observed within the Belgian data where male post-docs felt that their spouses were sacrificing more in terms of their own careers in order to help the male post-docs forward. Furthermore, while some of the female post-docs had concerns about moving abroad for valuable academic experience, because it would mean a relocation of the whole family, men in similar positions were not necessarily considering taking their family with them abroad. This finding runs parallel to a pattern that has been identified earlier (Heijstra et al., 2015) within the Icelandic data with regard to family responsibilities and work–family balance. We found that for women, prioritizing family was a condition, but for men prioritizing family was a matter of choice. While the women in the Icelandic sample were simply assumed to prioritize their family, the societal norms gave men the possibility to do so.

'Someone to watch over me'

From the analysis it turned out to be challenging to have participants discussing the downsides of the academic profession. While some of the Belgian interviewees did not consider it good manners to be discussing the more shadowy or dirty aspects of the academic profession, a female post-doc in Italy was clearly more open about it. She referred to academic housework as '*the blackmail of precariousness*' in which early career academics run the risk of being substituted and leaking out of the academic pipeline if they do not comply with the tasks that are given to them by more senior members. A similar comment came from a Dutch male mover who believed it to be impossible to say no to academic household tasks at the request of a supervisor. It therefore seems as if more senior academics function as gatekeepers, actively selecting who gets to continue down the academic path, and who discontinues. The notion of the presence of gatekeepers within academia also appears in the Dutch data where a female post-doc mover explained that she actively sought extra tasks, such as committee work, but that she was never given a chance.

However, there were other participants that had more positive experiences with regard to gatekeepers: not being asked to perform academic household tasks was cited by some, especially in STEM departments, to be an indicator that someone within academia was looking after the early career academics' best interests. He or she was given the space to focus on research and minimize teaching in order to get a research career going, which implies that teaching is considered to be a dimension of academic housework. In the Swiss data most of the interviewees describe their work conditions as excellent, and with enough time to attain to research. A Swiss STEM female participant explains that she was '*really, really protected from teaching, so we had a very small teaching*

load', which again suggests that teaching can be considered as academic housework. Furthermore this quote relates directly to the next theme, namely that of arbitrariness.

Gendered arbitrariness

The nature of academic housework entails that there is little official documentation on how much time, or how many academic housework tasks academics are supposed to complete. The situation turns out to be even more complex for post-doc students, as both the Swiss and the Icelandic data indicate that their academic obligations are often badly defined. Only in the Dutch case is there some kind of registration apparent with regard to academic housework. The Dutch academic employees receive a workload distribution table. Nevertheless, also in the Dutch case do few participants mention that tasks that would qualify as academic housework are explicitly mentioned in their contracts. The fact that academic housework is generally poorly administered consequently means that it entails a high level of arbitrariness. This becomes clearly visible within the Swiss data where being literate in French leads to more academic housework within the STEM department: 'In this department in particular there is a, a huge difference between people who don't speak French and people who speak French – and as I spoke French, I had a much, much bigger load of teaching hours', notes one of our interviewees. Another interviewee, notes that she's been 'relatively lucky', 'partly because people don't think [she] speak[s] much French'. So she hasn't been asked to provide a lot of courses that can 'ruin your experiments and ruin your (research) productivity'.

Whether or not speaking French has different outcomes for the career-making of men and women in the long run remains unclear. However, the importance of being given the opportunity to work on research rather than being occupied with teaching and administrative tasks is also displayed within the Italian data. A female post-doc argues: '*If you have the opportunity to do only data analysis you can learn and improve your skills. Instead, if you have to dedicate most of your time to administrative tasks you have less time for worthwhile activities like publications*'. This same female participant mentions, however, that she feels that the distribution of various academic chores is not at all arbitrary when it comes to gender, she explains: '*a young woman researcher is often considered a secretary and has to do numerous executive and administrative tasks; instead a young male researcher mainly does research activities, e.g. data analysis*'. A similar argument appears in the Slovenian data where a female leaver indicates that she was occasionally performing secretarial tasks. While she argued that she did not mind because she found it useful for her career, it is interesting that none of the male participants seem to have been using the word 'secretary' to describe their situation.

Discussion

The purpose of this article is to develop the concept of academic housework further, by addressing how academic housework manifests itself in different European academic contexts, and thereby obtaining a better insight into how early career academics, men and women, contend with it.

From the findings it has become clear that academic housework tasks are apparent in all six European academic environments, but with different emphases and nuances between the genders and departments. Gender plays a role, especially when it comes to certain undervalued tasks and how they are earmarked for women. In the more feminized departments such as is the case in SSH departments, participants more often mentioned teaching and teaching-related tasks with regard to academic housework, while STEM participants, working in largely male-dominated departments, tended to discuss research-related academic housework. We are therefore confident

that the concept of academic housework, in the sense that we put forward in this article, applies to the academic work environment of a broad group of academic employees, and not singularly to those in Iceland.

However, it is worth pointing out that many of the early career academics that we spoke to in our study did not necessarily hold a negative stand towards academic household tasks. There was a general level of acceptance for these tasks, as the participants frequently looked upon them as part of the academic profession work package, or as good investments into their academic career. Many were also convinced that academic housework contained valuable work experience that was worthy of their time investment. This is based on a conviction that might be understood as recalibrating to maintain a positive self-image while doing dirty work (Ashforth and Kreiner, 1999), as well as being an attempt to live up to the academic work ethic in order to be able to become part of the status group. After all, the price of belonging when entering the academy is considered substantial and may require institutional compliance and conformity. Criticizing certain aspects of the academic profession can easily be explained as lack of dedication to the academic work ethic, and objecting to academic household tasks was potentially a slippery slope, not the least in very competitive fields. Again there were nuances between the different groups of participants, for instance, while it may be relatively easy for participants with a STEM background to find employment outside the academic environment, this is considered more challenging for early career interviewees in SSH. This gives STEM interviewees two good reasons to complain less about academic housework than SSH interviewees: first of all if they do not like it they can quit and find employment elsewhere, and there were indeed indications of that. Secondly, because of smaller student–teacher ratios in STEM as compared to SSH, perhaps STEM early career academics have less academic housework to attend to, as we have seen in the GARCIA project, and therefore they do not feel the urge to complain about it. We indeed found evidence that early career academics with high teaching loads in SSH departments were more negative towards academic housework tasks than others. For that reason the academic housework tasks may press more on SSH interviewees than STEM interviewees. What is more, the SSH departments tend to be more feminized than the STEM departments, which implies that academic housework in the form of teaching and teaching-related tasks affects women more than men. This is a pattern that is not only visible in Iceland but appears in other countries as well (Dubois-Shaik and Fusulier, 2015).

It seems that most early career academics have a vision of the great work circumstances that they will eventually obtain once they have invested enough in their academic career. Autonomy, flexibility, intellect and job satisfaction is what early career academics are after rather than large wages. It was therefore remarkable that the Belgian data revealed that some movers actually experienced more autonomy and job satisfaction after they had left academia and found alternative employment. This is something that will be worth looking into in the near future. Valuable insights were gained from the other participating countries as well. Together with the Icelandic data, the Italian data made visible the fact that teaching activities can in themselves qualify as academic housework in cases where an academic is are not paid for the teaching. Furthermore, the role of supervisors with regard to the distribution and access to academic housework became clearly apparent. In turn, the Dutch and Swiss analyses provided important insight into the variety and arbitrariness of academic housework, while the Slovenian analyses made us more alert to the intangible parts of the profession and indeed the subordinate position of wages within the academic environment.

Within the data deriving from early career academics on academic housework, the issue of emotional work was not discussed. Still there are indicators that would relate emotional work in academia to the work package, especially to the academic work package of women that are being contacted to provide a listening ear or act as a mentor (Misra et al., 2011). This type of academic

housework, however, may be more relevant to more senior academics, for instance, those in full and associate professor positions. As this group of academics was not part of this current research, this will be an interesting research topic for future research. The expectation is that emotional work will be especially part of the academic household chores of academic women in the higher ranks. Altogether these new insights helped to develop the concept of academic housework. In its new definition the concept of academic housework represents:

> All the important but largely invisible and undervalued academic activities, which bear resemblances to the 'second shift', of which the extent and components are contingent with the employees' gender, academic rank, the work culture of the subject field, as well as the level of intervention of more senior gatekeepers.

The strengths of the study relate first of all to the credibility of the findings. In line with Denzin's (1978) discussion on triangulation, we have utilized multiple sources of data that derived from six different European countries. We collected data from both men and women, stayers and movers that were either STEM or SSH orientated, and relied on the expertise of multiple investigators.

With regard to academic housework, another strength of the study is the user-friendliness of the concept, which therefore may encourage the discussion of a topic that has so far still been largely a taboo in academia. Possibly in part because of the social stigma that goes with doing tasks defined as 'dirty' in a bundle of tasks that make up the academic profession (Ashforth and Kreiner, 1999; Hughes, 1951; Southgate and Shying, 2014). '*In this way the "dirty particulars" are wrapped in more abstract and uplifting values associated with the larger purpose*' (Ashforth and Kreiner, 1999). Such as is the case in our discussion on extra work that pays off and getting one's priorities straight. By broadening the concept, and not only referring to the situation in women's and gender studies but in other academic fields as well, the discussion can be helpful to a larger quantity of academics. In the Icelandic SSH departments this has already proven to be useful.

As in every study, this one also contains weaknesses. Except for the Icelandic data, the authors have not been able to work with most of the original data themselves, but instead had to rely on the analyses of other scholars. Nevertheless, from an ethical point of view we believe that it is important that experts within each country estimate and analyze the situation instead of approaching all data from the Icelandic perspective. This method has indeed led to new insights that we may have missed out on because of a plausible tunnel vision. Whether saturation has been reached is another relevant question. When taking the interviews we felt that we had reached saturation point, however, after having analyzed the data of the various countries together we now can see that new information could still be obtained.

On the topic of academic housework, the main weakness of the concept is that along the road we have also experienced scepticism. That is to say, some have wondered out loud whether all academic work, especially teaching and teaching related tasks, is suddenly going to be qualified as academic housework instead of being an integral part of the academic profession. Apparently, feelings of pride and prestige are still very relevant within today's academic environment, and some academics seem worried about allowing for discussion on more sensitive topics, as this in the long run may damage the image of the academic as an ideal and clean (not tainted by dirty work) worker. Our analysis has formed a bridge between macro approaches on female dominated work in the labour market as an extension of women's domestic roles, and micro-level interaction in workplaces in which certain aspects of the domestic sphere, i.e. housework, spill into the work environment. In addressing the leaky pipeline phenomena within the same institutions and thus covering the same participants, Dubois-Shaik and Fusulier (2015) have identified the institutions as gendered in the sense that all follow the scissor-shaped curve facilitated by

bottlenecks, glass ceilings and sticky floors – the third phenomena especially related to teaching which is linked to feminization of the teaching staff at the lowest level of the academic ladder. Taken together this has a ratchet effect for women, i.e. 'symbolic and recognition-based hurdles to cross' (p. 5) dependent on material conditions and configurations. This gives us some indication of the plausible effects of doing academic housework. As for future research to further test the concept we suggest a bigger sample that can better access gender effects and consequences, addressing other parts of the (academic) world, longitudinal studies that can better map academic housework and related phenomena, i.e. leaky pipeline, glass ceiling, sticky floor, movers and well-being.

To conclude, by developing a low-threshold concept to discuss a sensitive problem, our hope is that the topic of academic housework becomes more easily discussable. By raising more awareness of the concept on European level, this undervalued part of the academic profession will hopefully receive more discussion in other countries and eventually lead to this type of work being valued to a larger extent than it is now. Subsequently this should benefit early academic career makers, and women in particular.

Declaration of Conflicting Interest

The authors declare that there is no conflict of interest.

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Women in science: The persistence of traditional gender roles. A case study on work–life interface

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Abstract
The underrepresentation of women in academe has been the focus of both academic literature and European policy-makers. However, albeit the number of female scientists has increased, true gender equality has yet to be achieved. When examining the reasons for this, we have to consider the interconnection between the expectations surrounding gender and what it means to work in the scientific profession, operating at individual, interactional, and institutional levels. This paper presents the results (and methods) of a survey exploring work–life interfaces from a gender-sensitive perspective.

Our survey focused on the researchers and professors working in the medicine and engineering departments of the University of Pisa, where the gradient of female exclusion is most pronounced. The results allow for an interpretation of the 'leaky pipeline' (macro level), through a gender-sensitive analysis of gender-based social obligations and those associated with the scientific profession (micro perspective), by integrating said reading through a description of the dynamics of continuous negotiation in private and public life (university) (meso level). Essentially, science is a greedy institution, as is family life, which is a problem for a woman's career, unless she is willing to make considerable concessions at home.

Keywords
Women in science, work–life interface, leaky pipeline, gender-sensitive approach, greedy institution

Introduction

Part of the European Union's scientific policy is to promote innovation, which is inextricably linked to awareness and social responsibility. Within this framework, the EU's institutions have

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developed actions aimed at capitalising on and nurturing talent, particularly female talent, with a view to increasing female presence in key roles in research institutions. Said policies and actions have enjoyed a decade-long tradition[1] and said phenomenon has long interested international literature;[2] however, the data on scientific careers reveal the underrepresentation of women in research, which is proportional to the responsibility and prestige associated with the role held (EC, 2013), and which is affected by the differing social reputation of a discipline, as is evident in the scientific/technological field, but even more so in engineering (August and Waltman, 2004).

To illustrate the dynamics of the exclusion process, which allows for a progressive loss of female talent, international literature offers a number of interpretations for the phenomenon, starting with different perspectives, which, in our view, are not necessarily mutually exclusive.

Some adopt a *macro* perspective and use the *leaky pipeline* metaphor (Berryman, 1983) to underline the distorted effects of selection processes and career access in the world of science that are anything but gender-neutral, and which systematically penalise women. Others, in observing the dynamics and processes at a *meso* level, have emphasised the dynamics of exclusion and discrimination resulting from the way in which work is organised in science and academe (Rosser, 1999, 2004; Rosser and Lane, 2002).[3] These contributions postulate the existence of organisational mechanisms, which, at both the formal and informal level, would offer women scientists fewer opportunities, thereby creating a barrier to the advancement of their careers, reducing their level of job satisfaction, and as a result, their interest in pursuing an academic career (Settles et al., 2006).

Lastly, at a *micro* level, significant national and international literature has proposed an interpretation based instead on the effects of the interaction between childcare and the responsibilities linked to research (*work–life interface*). Research has in fact highlighted how, in crucial moments of their scientific careers, women tend to choose to abandon academia ('fight or flight response') for reasons outside of the professional realm, citing instead reasons of a private nature (Joecks et al., 2014; Xie and Shauman, 2003). Not surprisingly, the dynamics of a couple and the demands of reconciling work and private life have been identified by women scientists as the primary obstacles to the advancement of their careers (Aisenberg and Harrington, 1988; Barnes et al., 1998; Biancheri, 2013; Riger et al., 1997; Rosser, 2004).

From our point of view, based on the approach advanced by Amy Wharton (2005), the three perspectives cited above offer interpretations that are considerably more productive if used in an integrated manner. Only by contextualising the dynamics and processes of each level can the numerous mechanisms reproducing gender equality be understood. These mechanisms act and retroact on three different levels (*macro*, *meso*, and *micro*).

This paper presents the results of a survey conducted in the framework of the TRIGGER[4] project, in the departments of medicine and engineering of the University of Pisa (see sub-section 'Building an empirical base' for the reasons behind our choice). The purpose of the survey was to identify and reveal the role and scope of the dynamics of *work–life interface* through a gender-sensitive survey focusing on time management. Our aim was to provide an interpretation for the *leaky pipeline* (*macro* level), by means of a *gender-sensitive* analysis of the friction between gender-based social obligations and those typically associated with the scientific profession (*micro* level), by integrating our interpretation via a description of the ever-changing dynamics present in the family and in academia, i.e. the *meso* level.

Methodology

Building an empirical base

The empirical base was determined according to the cognitive objective and the adopted perspective. In order to show the degree of 'compatibility' between gender-based social obligations and

those inherent to the scientific profession, it was necessary to observe the behaviour and experiences of men and women scientists so as to compare lifestyle choices and strategies adopted in everyday life. Moreover, to gather information on the processes determining the *leaky pipeline* via *micro* and *meso* levels, we felt it worthwhile to focus on those disciplines where gender-based asymmetries are especially evident. It is for this reason that we decided to limit our study to those fields with the worst performance in terms of female participation and academic career levels. We also decided to concentrate on the practices and choices of those subjects who succeeded in securing a stable academic position (men and women researchers with open-ended contracts, male and female associate professors, and lastly, male and female full professors).

The number of women in academic positions at the University of Pisa is within the national average (Biancheri and Tomio, 2015; Frattini and Rossi, 2012); however, a closer examination of the women occupying top academic positions in the medicine and engineering departments revealed both university departments to be 'women-unfriendly'. When comparing the performances between the two departments, the medicine department recorded the highest leakage rate (equal to 50%), whereas the engineering department had the lowest female presence, which, despite being relatively stable on all levels in the hierarchy, was almost negligible (approximately 10%; see Figure 1).

Following these initial assessments, our universe of reference comprised 557 subjects (M=407 and F=150). In view of the limited number of subjects, we decided not to do any ex ante sampling; instead, we would conduct the survey on the entire universe of reference. To reduce the rate of loss to the absolute minimum – given the type of questionnaire and characteristics of the universe of reference, the rate could have been very high – we opted for a written questionnaire, to be filled out in person.

The questionnaire was distributed during the departmental meetings of the university, thanks to the collaboration of the Heads of Department. This meant that, in a way, our questionnaire was *endorsed* by the department heads, which secured higher participation and minimised the distortion rate of the questionnaire, as department meetings are compulsory. Our research group was able to participate in more than one meeting per department (in the period of reference, between October 2014 and March 2015). To guarantee absolute anonymity, checklists were used to monitor the representativeness of the respondents in terms of the universe of reference and the two main variables, i.e. gender and academic position, and also to ensure that the same professor did not fill in the questionnaire twice. With regard to the former variable, we expected an upward distortion rate, given that professors high up in the hierarchy tend to attend departmental meetings more than others, but we felt that said distortion would be in line with our cognitive objectives.

The strategy we adopted for the distribution of the questionnaire guaranteed a high response rate, equal to 44% (a total number of 245 questionnaires were completed in full). The gender composition of the sample corresponds to that of the population (the universe of reference stood at 27% female, which was respected in our sample, with 29% of respondents being women). The incidence of respondents with advanced academic positions was high (see Figure 2).

Figure 2 highlights the differences between two variables: gender and academic position. The sample of male professors reveals a slight over-representation of professors in the first category (+5%) to the detriment of the other two (−3% associate professors and −2% researchers). In the female respondents, there is an over-representation in the first (+4%), but above all, in the second category (+14%), to the detriment of the third, which is highly under-represented (−18%).

Structure of the questionnaire

The questionnaire was structured based on the evidence found in international literature, and was organised according to the aforementioned analytical perspectives.
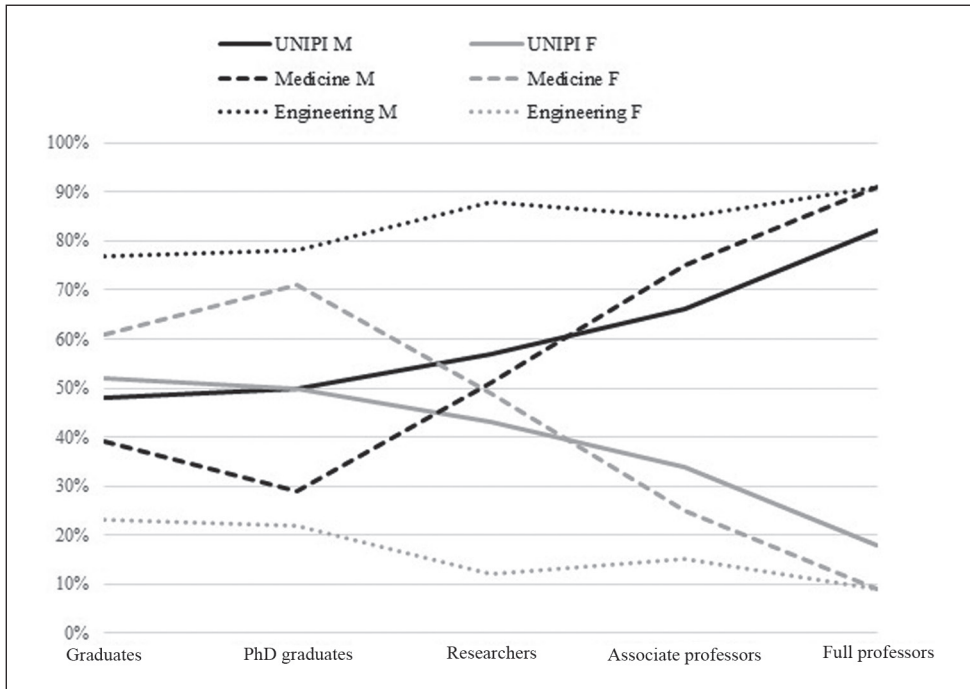
Figure 1. Comparison between career advancement of male and female professors in the departments of medicine and engineering and the averages for the University of Pisa.
Source: Elaborated administrative data from the University of Pisa (data at 31 December 2013).
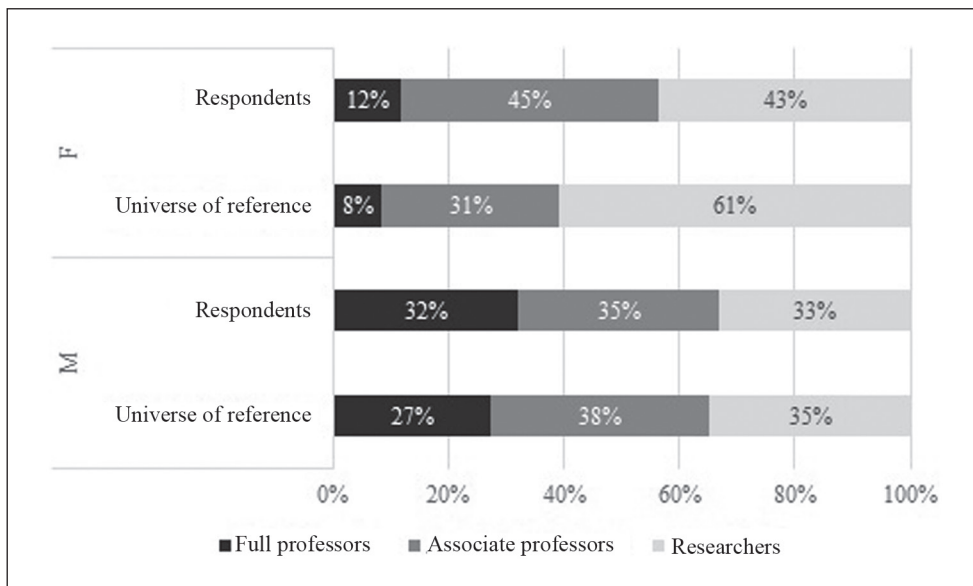UNIPI: University of Pisa.

Figure 2. Comparison based on gender and role between universe of reference and sample.

Specifically, in order to use the results of the research carried on a *micro* and *meso* level to better understand the *leaky pipeline* phenomenon from a *macro*[5] level, the questionnaire is based on:

(a) the *micro* perspective, to reveal any friction or tension between gender-based self-perception and behaviour (Ruspini, 2003) and the socially constructed implications surrounding the 'scientific profession', revealing any choices made in one role but based on another;
(b) the *meso* perspective, to show the outcome of negotiating/reconciling family and work obligations and the effect (explicit and intentional) of the decisions made in one area on the other.

Our questionnaire was divided into three sections (with 31 closed-ended questions[6]) dedicated to gathering: firstly, personal information, family formation, and academic position; secondly, how domestic chores and childcare activities are shared; and lastly, information on the work management strategies adopted (by the respondent and his/her partner).

The questions and multiple choice answers of each section were created based on the criticality and potential areas of friction highlighted in the reference literature we analysed.

The first section, used to gather personal data and information on family formation and academic position, aimed to expose the constraints and opportunities specifically related to household characteristics and variables that are important in time management. The objective was to reveal any 'choices' that may be typed according to the sex of the scientist and which can be attributed to the desire to find a synthesis in potentially conflicting roles.

Analysed dimensions, academic position, marital status, and family choices were identified and elaborated thanks to national and international research results. Indeed, said research highlights the major importance of marital status, which is occasionally identified as a predictive factor of career prospects. Indeed, there is a positive correlation for women between being single and having a stable position as a researcher (Ginther and Kahn, 2006); vice versa, when investigating the link between marriage and career advancement, there is, frequently, a negative correlation (Fox, 2005; Hunter and Leahey, 2010; Martinez et al., 2007). This penalisation increases exponentially where children are present. Indeed, being a parent is the most significant factor associated with poor productivity and reduced career opportunities (Fox, 2005; Stack, 2004).[7]

Male scientists are not faced with the same trade-off: in most cases, those male scientists who want children can turn to their wives/partners for assistance (Joecks et al., 2014). The importance of this 'alliance' is confirmed by the statistics on the prevalence of the traditional family model (where the man of the house is also the breadwinner) amongst scientists with a brilliant career, especially if they have also made difficult decisions in their private lives (two or more children). In this regard, it is interesting to read what one professor had to say about his experience vis-à-vis work–life interface:

> The third disadvantage involves my wife who gave up her career as a physician and stopped transplanting bone marrow to become a housewife. Although we had to give up the comfort of two salaries, this step was essential for me to continue my research career (Gregan, 2006: 3).

In dealing with these perverse dynamics, women scientists, more often than their male colleagues, choose to have fewer children than they may have originally wanted (Mason and Goulden, 2004). Other studies highlight the different strategies adopted, from postponing maternity until a stable job in research has been secured, to knowingly forsaking children to dedicate themselves fully to science (Dean and Bandows-Koster, 2014). Furthermore, women often decide to stop working when their first child is born, as they find the two roles to be incompatible and are unwilling to forego the experience of maternity (Joecks et al., 2014).

The second and third sections of the questionnaire were aimed at revealing the work–family interface by studying how the management and sharing of either household or professional obligations can potentially influence participation in the other (Voydanoff, 2005; Williams, 2001), leading to a dynamic of friction or consolidation. To understand this, we decided to gather information on the strategies adopted in each area separately, i.e. the second section of the questionnaire would deal with the respondents' private life, the third with work responsibilities.

The second section, which deals specifically with how household and childcare responsibilities are shared, was structured according to the main responsibilities associated with the roles of mother and wife, which, as stated above, have a negative correlation with female career prospects. The aim of the questions was to reveal the practices adopted by the families of men and women scientists, and understand the decisions they make on an everyday basis to fulfil the obligations related to the main activities that need to be performed.[8]

The third and last section of the questionnaire aimed to reveal the strategies adopted to manage professional obligations (of the respondent and his/her partner), by identifying the consequences of the choices respondents made in their private lives in reference to the average work commitments of the family members, and by asking that respondents provide their own feedback on their work–life interface. This section also hoped to determine to what extent the rules governing academia favour the active participation of all staff members (Fitzgerald, 1988; Husu, 2001). The aim was not to analyse the organisational practices of the single departments, but instead to identify what Gherardi (1998) referred to as the 'symbolic order of gender', by establishing those practices or perceptions related to 'social beliefs as to what is appropriate and what is inappropriate for the two sexes and for their social relationships' (Gherardi and Poggio, 2003: 6) and the repercussions of these beliefs on the concrete opportunities for workplace involvement and on career prospects, together with the satisfaction levels of men and women (Settles et al., 2006).

Data analysis

In keeping with the structure of the questionnaire, this paragraph shall provide the main results that emerged from our study in a logical sequence. We shall proceed to illustrate the most significant results, section by section, providing a gender-sensitive interpretation, which, where possible, means combining gender and academic position. Considerations of a transversal nature will be discussed in the conclusions section.

With regard to the first section, linked to family formation and marital status, the questionnaire allowed us to identify various ideal or pure types of family structures, whose frequency is inextricably linked to the gender of the respondent.

Starting with marital status, we observed a distinct preference for the traditional family model amongst male respondents, including marriage. Indeed, 77.1% of men are married; the percentage of married women is 66.2%, more than 10 points lower. This gap is bridged almost entirely by the discrepancy observed in couples living together, where 11.3% of women and a mere 3.5% of men choose to live with, not marry, their partners. In the scientific world, and the rest of the population for that matter, women prefer this family setup as they feel that living conditions will be easier and gender-based roles will not be as rigid as is the case in marriage (Saraceno and Naldini, 2011). Conversely, men tend to pursue a more traditional family model, including marriage, not because they are bigger traditionalists, but because this choice is in line with their career goals: as already stated above, the traditional family model constitutes a powerful ally for a man's career goals (Xie and Shauman, 2003). It is therefore not surprising to see a significant presence of families founded on the model of the male breadwinner (see Figure 3).
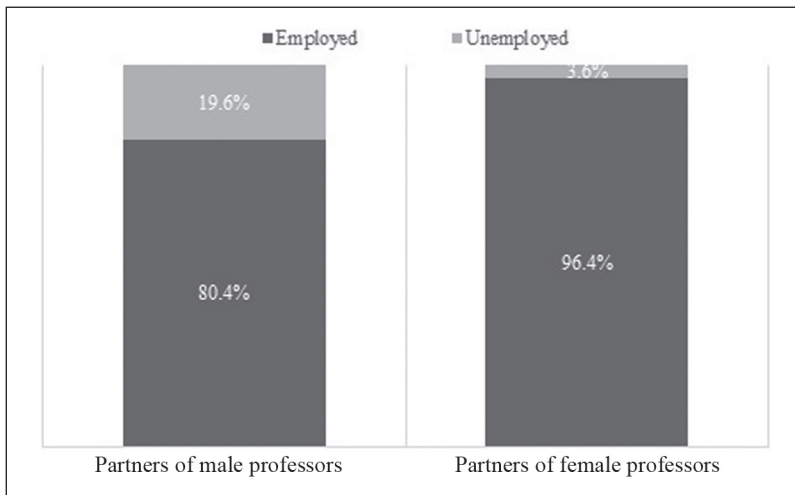
Figure 3. Employment status of male and female professors' partners.

Contrary to what we would expect, starting with the evidence cited in international literature, the condition of being single is not one of the strategies adopted by women wishing to make a career for themselves in the world of science. The frequency of this condition is quite similar for both sexes (11.2% for men and 12.7% for women). Despite the fact that this choice is more common among women in high academic positions, there is no distinct correlation.[9]

We have already stated how the correlation between marital status and career prospects does not always and unequivocally single out marriage as an obstacle to women's careers. This is not the case when it comes to having a family. Indeed, in this case, all the research carried out shows similar results, i.e. that maternity is the biggest obstacle to female careers. Our study revealed the same results, with one in three women having no children, compared to one in five men. When women do decide to have a family, they try to limit the burden of childcare by limiting the number of children (in our sample, only 8.9% of women scientists have three children, compared to 16.3% of men; no women has four or more children, whereas 2.4% of men do). What is also interesting is the average number of children per professor. For women, that number is 1 (regardless of field of study), whilst for men the average is higher (1.3), with a non-negligible variation in field of study (1.2 for the professors of engineering vs. an average of 1.6 for the professors of medicine).

In brief, the ideal family type for a woman in academia is less rigid: there is a tendency to move towards a negotiation-based management of family obligations, which is nonetheless conditioned by public life, in that family formation tends to be influenced by the impact of managing childcare. Therefore, it seems that the attempt made to strike a balance between childcare and professional obligations is not wholly effective; indeed, it features the same asymmetries identified in female participation in the workplace and participation in home life.

In keeping with the emerging profile, our findings based on the data gathered in the second section of the questionnaire – regarding the sharing of household chores and childcare within the family – show the persistence of highly discordant cultural models, not just in terms of childcare management, but also in terms of sharing household responsibilities (which explains the negative correlation between marriage and academic career).

Based on what we have learnt about the Italian population from the surveys carried out by ISTAT in 2007, even families with at least one member in academia are privy to the persistence of an

asymmetrical sharing of household duties, as a result of socially constructed gender-based roles. The sharing of household duties is influenced by the conviction that certain duties are 'better suited' to women and others to men. The more time-consuming domestic chores are done by women: cooking, cleaning, tidying, washing, ironing, daily and weekly grocery shopping. Indeed, 64% of women perform these duties themselves; only 1 in 4 women ask their partners for assistance. The situation for men is very different: only 36% are in charge of the aforementioned chores; more than 1 in 2 men prefer to entrust their wives or partners with such activities. Men are responsible for chores that are sporadic or linked to the use of tools, for example maintenance work around the house or paying the bills, or responsibilities related to the public interests of the family, such as attending meetings for tenants and homeowners. These are duties they perform in 3 out of 4 cases; they only assign them to their partners in 17% of all cases. Only 36% of the women respondents do these chores themselves – they prefer to have them done by their partners (47% of cases) or by paid staff (13%).

What is extremely interesting is the cross-reading of the sharing of domestic chores when considering the couple as a whole. When one partner is responsible for the main daily activities that are extremely time-consuming, the other partner is free to dedicate his time to other tasks, including his work. As a result, the woman partner of a male professor, who undertakes the most demanding domestic chores, is the primary ally of her partner's/husband's work commitments. In those couples where the woman is pursuing an academic career, she continues to perform the domestic chores traditionally associated with women, which are also more time-consuming, meaning she is still the main support system for her husband's/partner's career.

As for childcare in couples with children of pre-school or school-going age, 1 in 3 women professors take care of their children in the afternoon, with only 4.8% asking their partners to do so (the rest rely equally on staff and informal networks); male professors rely on their partners (50%), with only 14% performing the activity themselves. Our study showed similar results for female professors during school holidays. Conversely, male professors are more involved in childcare during this period, becoming the primary caregivers (34%). More than half of women professors look after their child/children when they fall ill (51.2%), with only 34.4% of men caring for their sick child/children. Clearly, there is an unequal distribution of duties within the couple: one in two men professors have their partners/wives perform this duty, whereas only 11% of women professors ask their partners/husbands to do it. In three out of four cases, professors who are also mothers take their children to the doctor and attend parent–teacher meetings; only two in five male professors do such duties – they prefer to have their wives accompany the child/children.

With regard to the questions on the presence of family members with special needs – including members with disabilities or older members requiring assistance – the data showed that fewer than 3 in 10 respondents have such a situation at home (28% of male professors, 25% of female professors). Although the percentages are low, meaning we should be cautious in our analysis, we must underline how, yet again, women are more directly involved in the daily management of caregiving: in almost four out of five cases, they help every day or more than once a week (this kind of commitment is shared by one in two men). If not the woman of the house, the primary caregiver differs between the two sexes: with men professors, it is paid staff, whilst women tend to resort to informal networks, which affects not only the continuity of the service provided but also the extent of 'coverage' provided.

Faced with such asymmetries, it is not surprising that women professors tend to live near their workplace, more often than their male colleagues (95.4% of women live within a 50 km radius of their workplace). In this way, they reduce their travel time to and from work, meaning they have more time to manage their so-called *double presence*, both their professional responsibilities and domestic chores (Balbo, 1978). This same strategy is used by men too (although the frequency drops by 10%), who use the extra time they have to reinforce their presence in the workplace.
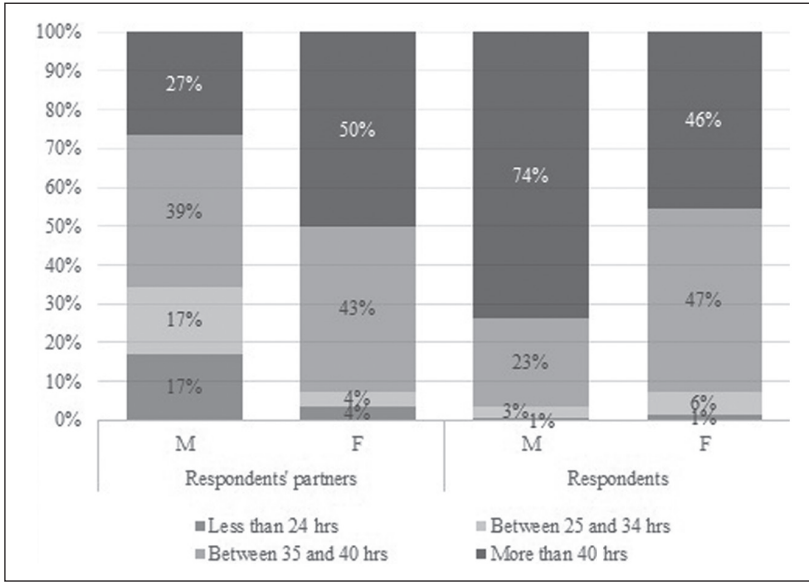
Figure 4. Answers to the question on 'average working hours in a typical week', aggregated per gender. The first two columns represent the answers regarding the respondents' partners; the third and fourth columns represent the respondents.

In light of how household duties are shared, it is not surprising to see the results of the third section of the questionnaire, dedicated to the management of professional obligations (of both the respondent and his/her partner).

We have already underlined the inextricable link between male professors and their career prospects and how one in five of their wives/partners dedicate themselves wholly to domestic life (see Figure 3). It is not surprising that the asymmetry in sharing domestic chores and childcare activities translates into significant inequalities in participation in professional life, and into perverse effects on the career prospects of men and women. It is also not surprising that women have less time for work-related activities, even when they are women of science (see Figure 4). If 45% of the women interviewed claim to work more than 40 hours a week, it is easy to understand why, in most cases, these women have no children or only one. Conversely, three quarters of male professors are able to take on a heavier workload, thanks to the alliance they have forged at home with their wives, who, if they work, work fewer hours (2 out of 5 work less than 35 hours a week).[10]

When analysing the degree of satisfaction with the organisation of work and domestic and childcare responsibilities, we did not identify any significant differences between the two sexes, which is in line with other studies carried out in Italy (Palermo et al., 2008). Is it because of a lack of awareness of the dynamics at play, or because of the absence of any other organisational models, or because of a cultural construct that clearly divides professional and private life and that is unable to represent either sphere? The debate is still open.

We are aware of the fact that our proposed reading of the results is one-directional, that we have not considered whether or not work can play a role when performing household duties, not just in light of the results stemming from our macro analysis, or the high presence of *leaking*. The answers given about reduced working hours, leave of absence or time off work, registered, once again, significant asymmetries, both in terms of the use of such practices and the reasons for requesting them.
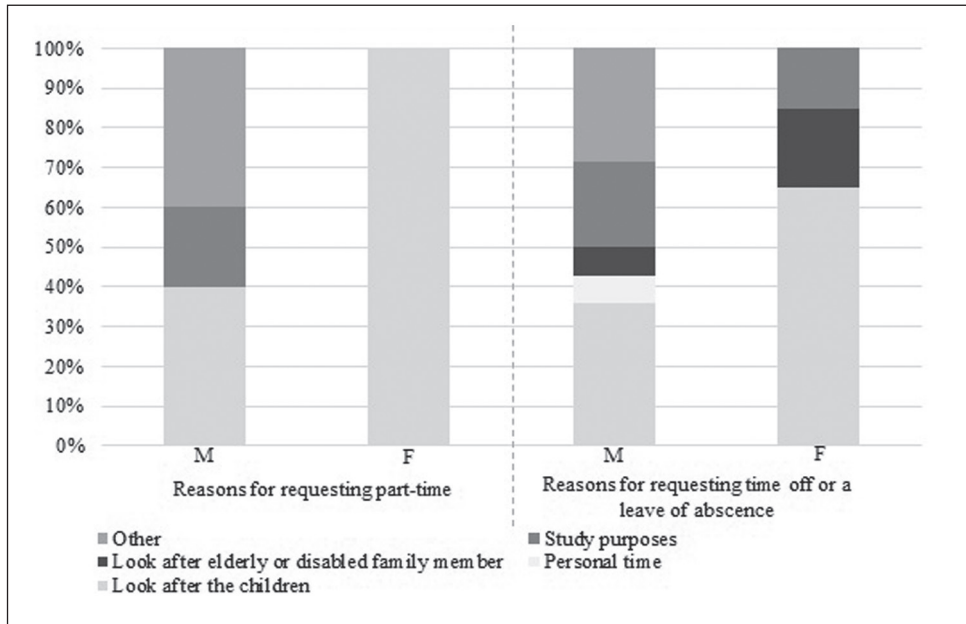
Figure 5. Answers to the questions listed on the *x*-axis and aggregated according to the gender of the respondents.

Men resort less to leave and time off from work (4.9% vs. 22.1%) than they do to reduced working hours (1.2% vs. 2.9%) and when they do it, it is not for reasons linked to caregiving (see Figure 5). It is therefore difficult to imagine that the workplace is in fact women-friendly when caregiving is the only reason women work part-time, and the reason they request a leave of absence or time off from work in 70% of cases.

This becomes even more evident when examining the answers to the questions on the impact of parenthood on a professor's career. Of the men, 84% refuse to admit that there is a link and that the link can be negative. Of those who claim to have observed a negative link, half of them are unable to identify specific discriminatory behaviour; they limit their claims to a general feeling or sensation. Those who have felt tension between the two roles are able to identify specific problem areas, and tend to attribute the dynamic to a deterioration in interpersonal relations, resulting from less freedom in managing their work schedule and participating in additional work-related activities. Women perceive the situation quite differently. In this case, the minority (38%) believes that maternity does not hamper careers, whereas seven in 10 women feel that there have been distinct examples of discrimination due to maternity. The prime suspects are the sharing of responsibilities (46.8%), followed by and tied with the organisation of their work schedule and interpersonal relations (17.4%).

Conclusions

The aforementioned reveals a dangerously persistent situation. The effects of socially constructed gender-based roles and the gender-based system utilised in social institutions seem to indicate the presence of one-directional processes that mutually support each other, thereby reinforcing the perception of mutual exclusivity between the role of mother and wife/partner and the role of academic.

If it is generally true that work and family are 'greedy' for time and energy, and that they require loyalty and dedication (Coser, 1974), then trying to remain committed to both your professional and personal life is very risky, especially if the subject's professional life happens to be in academia, a highly competitive environment that requires extreme flexibility and absolute dedication (Caprile et al., 2012).

The traditional, gender-based separation of duties allowed for the fulfilment of high standards, by clearly distinguishing the assignment of duties according to the field of study. With the arrival of women on the work scene, said sharing of duties was brought into question, without, however, altering it significantly. It is no coincidence that the penalisation resulting from family life and professional duties affects men and women very differently (Simard et al., 2008). Moreover, only women seem to be the ones penalised, overwhelmed by the burden of childcare. Men, on the other hand, seem to receive a sort of 'family bonus'. We can easily see the effects of the virtuous alliance between work and family life forged for men (Friedman and Greenhaus, 2000). An alliance forged to the detriment of women.

Our analysis has highlighted the subordinate status of the wife/partner of a male university professor. Thanks to her role, because she looks after the children, because she performs the most time-consuming duties, the male professor can dedicate himself fully to his profession, as would be expected of a scientist, without having to make significant sacrifices in his personal life. The woman takes on the role of housemaid, of supporter, and even women scientists are unable to free themselves of this role. We have seen how they take on the more time-consuming duties, both in terms of domestic chores and childcare. As a result, and given the rigidity of home life, family commitments begin to compete with work. Female academics do not have an ally at home that can help them so that they are free to dedicate more time to their work; that is why they frequently pay people to assist them, although this does not mean that they are not the main caregivers and homemakers (Ledin et al., 2007).

The dynamics that lead to a continuous loss of female talent in science (*leaky pipeline*) have a powerful ally in the socially constructed roles and gender-based expectations of our society and on the common understanding of 'doing science'.[11] The experience resulting from this mutual exclusivity determines women's choices in both their public and private lives: sometimes they forsake one for the other, other times they consciously modify their participation in one in favour of the other, and other times still, they sabotage their participation in one because of the other.

Evidently, when faced with such persistent models of reference, the model proposed by Etzkowitz et al. (1994) risks becoming the norm. This model divided women scientists into two macro categories: those who adopt a male-like behaviour and dedicate themselves fully to science ('instrumentals' – they take on all the risks associated with a highly competitive and unpredictable profession) and those who succeed in managing both their professional and private lives, without intentionally forsaking either ('balancers'). In light of the dynamics observed, we cannot refrain from making a rather painful observation. The interpretation proposed by Etzkowitz et al. (1994) is frequently cited in reference literature (Satow, 2001; Sesay, 2015; Trauth, 2006) and on the one hand risks identifying negotiation processes as individualistic strategies, processes with powerful cultural and organisational characteristics, and on the other risks convincing us that 'balancers' can actually find a happy balance with their 'double presence'. Not only does such a strategy conceal the reasons why so many women abandon the scientific careers they had once undertaken,[12] but it also tends to hide the processes that cement the inequalities leading to unfair competition between men and women in science. Faced with such asymmetries, it is hard to imagine that women are allowed to compete on the same playing field, when the time they have for research and for producing results – one of the predictive success factors in academia – is constantly reduced by their private lives. Therefore, it is safe to conclude that women in scientific careers belong to one category alone: that of 'jugglers'. But they are juggling fire, and risk, in *primis*, being burnt, being scarred for life, being inflicted with permanent damage.

Declaration of Conflicting Interest

Funding

Notes

1. See the report on women and science: *Science Policies in the European Union: Promoting Excellence through Mainstreaming Gender Equality* (European Commission (EC), 2000), whose approach was recently adopted in EU Regulation No. 1291/2013 (EU, 2013).
2. Interest in the rapport between gender and scientific thinking emerged during the feminist movement, specifically during the debate launched internationally in the 1970s on the professional condition of women scientists (e.g. Rossiter, 1993). From there, the debate moved from the 'issue of women' to the more generic 'issue of science' in the 1980s (Harding, 1986), or, to put it the same way as Evelyn Fox Keller (1991: 277), the focus shifted from 'women and the scientific profession women and the pursuit of science' to 'men and women and the pursuit of science'.
3. Worth noting is the contamination of research and policy. Thanks to these studies, the approach adopted by EU projects has focused on the cultural changes needed within the research system of academia, the working environment, and laboratories (EC, 2010).
4. The TRIGGER project (TRansforming Institutions by Gendering contents and Gaining Equality in Research) is financed by the European Commission for the period 2014–2017, as part of the 7th Framework Programme. See: http://triggerproject.eu/.
5. As stated above, the macro perspective was utilised to identify the fields of study to be included in the survey, to guarantee statistical significance (by selecting those fields where the leaking phenomenon is particularly evident).
6. This questionnaire can be defined as 'simple': it is structured in such a way that it is easy and quick to fill in, meaning the rate of participation increases.
7. Research shows that women's careers in STEM (science, technology, engineering, and mathematics) are more affected by family formation; indeed, women find themselves at a disadvantage only if they have children and not because of their marital status (Xie and Shauman, 2003).
8. The standardisation of responsibilities was changed following the results published by the National Institute of Statistics (ISTAT) on daily life (available at www.istat.it/it/archivio/91926; accessed 10 July 2014). The questions asked that the respondent indicate the main person involved in completing these duties and then any additional figures.
9. It is worth citing a recent study conducted in the USA, which determined a significant gender gap of +11% in favour of women (Schiebinger et al., 2008). The average number of single women in the American study was quite similar to the average number in our study (14% vs. 12.2%).
10. By means of a detailed analysis of gender and field, we have determined that women engineers work on average more hours per week than women doctors (57% of women engineers say they work more than 40 hours a week, while 51% of female doctors estimate a weekly workload of between 35 and 40 hours). In their male counterparts, the gap is smaller (70% of engineers estimate their weekly work commitments to be heavy, compared with 79% of doctors).
11. For more on the processes of redefining the contents and values of 'doing science', see Ziman (1987, 2002) and Bourdieu (2003). For a summary of the implications of such changes for female participation, see Cherubini et al. (2011).
12. It might be appropriate to define a separate category at this point, given the number and importance of the reasons given, so as to better understand the dynamics of the leaky pipeline phenomenon. This category, in view of the priorities and choices of these women and to be consistent with the classification suggested by Etzkowitz et al. (1994), could comprise the so-called 'expressives'.

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The domestic basis of the scientific career: gender inequalities in ecology in France and Norway

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Abstract
Gender-related inequalities in scientific careers are widespread, evidenced by the attrition of women along the different stages of the promotion ladder. We studied the interwoven personal and professional trajectories of researchers in ecology and compared these trajectories between

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France and Norway. Given their differing welfare state policies and work/family regimes, we expected contrasts in the depth and modalities of the gender gap. We focused on the career consequences of time-use inequalities in the workplace and in the private sphere (domestic tasks and parental care). We find a more frequent assignment of women to less-valued tasks at work (e.g. teaching) and pronounced gender differences in the involvement in domestic and parental tasks, especially in France. Age at promotion and probability to be promoted differed between gender in both countries and more so in France, women being less promoted and promoted later than men. This gender gap was particularly discriminating women with children, when they were either single or with a partner who also was a researcher. These differences are mainly due to a lower scientific productivity of women when they get children. These analyses raise a number of questions on welfare policies and on the definition of academic standards of peer judgment within local employment policies in universities.

Introduction

The gender gap in academic careers is known to be persisting, though to different extents, in most countries where gender studies have been performed. Career attainment of female and male scientists has thus been studied since the 1970s, in North America (Bayer and Astin, 1975; Long, 1990; Long et al., 1993; Zuckerman and Cole, 1975) and more recently in Europe (Acker, 1980; Dubois-Shaik and Fusulier, 2015; Osborn et al., 2000; SHE Figures, 2009). Given that the men/women ratio consistently increases with the advancement of professional careers, most analyses have focused on explaining differences in promotion success of men and women to understand the processes behind this well-known 'glass ceiling' effect (Henley, 2015; O'Brien and Hapgood, 2012).

Several subtle processes in the work environment have already been pointed out as acting concomitantly, accounting for the attrition of women along scientific careers. First, the number of published papers has often been shown to be lower for female than for male researchers (Cole and Zuckerman, 1987; Mairesse and Pezzoni, 2015). However, the relation between the number of publications and gender-specific career outcomes is complex. Scientific productivity can mediate the effects of gender on promotion chances, or take part in a circular causation, whereby early career success provides more resources for research and publication, which in turn raises the chances to be promoted and so on (Merton, 1968; O'Brien and Hapgood, 2012; Petersen et al., 2011). According to the 'male clockwork theory', the academic career is built upon a male model, which tends to penalize periods of lowered productivity, such as motherhood (Ward and Wolf-Wendel, 2004). The study of such structural factors has been complemented by the identification of men's and women's beliefs and attitudes (Sonnert and Holton, 1995). Having been socialized to different behavioural norms, male and female researchers have developed professional ambitions shaped by gender models defining men as more inclined or able to embark upon demanding careers (Marry and Jonas, 2005). The fact that, all other things being equal, women apply less frequently for promotion than men is a compelling example of the role of socialization on the construction of professional ambitions (Sabatier et al., 2006). This is consistent with the observation that, like in other male-dominated working environments (Laufer and Pochic, 2004), academia is characterized by the prevalence of gender-based excellence criteria and promotion systems (Backouche et al., 2009; Van den Brink and Benschop, 2012). Second, allocation of time in less career-wise activities

(teaching and pedagogical responsibilities) is more frequently reported by women than men (Lockwood et al., 2013; Zuckerman and Cole, 1975), which, in academic systems where the evaluation of career is mainly based on scientific productivity and impact (Henley, 2015), translates into differential career advancement and reputational gains (Paye, 2013; Rafnsdóttir and Heijstra, 2013; Toren, 1993).

While processes determining the gender gap in scientific productivity and chances of promotion are still debated, a number of studies have pointed to the importance of work–family balance (Van Anders, 2004), parenthood (Cole and Zuckerman, 1987; Kyvik and Teigen, 1996; Ward and Wolf-Wendel, 2004) and family structure (Fox, 2005) on gender differences in professional trajectories. Various studies stress the factor that parenthood accounts for temporary spells of lower scientific performance (productivity, visibility; Hunter and Leahey, 2010; Long, 1992), which can have long-lasting consequences for career advancement (Zuckerman and Cole, 1975). However, the extent to which parenthood impacts careers may depend on the involvement of men in domestic and parental duties, and not only on the family structure. Gender and time-use studies highlight that domestic inequalities are widespread at all levels of professional occupations, though to different degrees depending on country (Forste and Fox, 2012; Sani, 2014). Gender inequalities in science may therefore be produced in the domestic sphere also, through both family structures and involvement in domestic and parental tasks (Comer and Stites-Doe, 2006).

These observations led us to investigate how the articulations between work and family can impact the career dynamics of men and women occupying permanent jobs in scientific research. We compared two countries (France and Norway) that have both implemented welfare measures to help women to combine working and having children, spend a higher proportion of their GDP than EU average on family benefits, provide easy access to care facilities for preschool children, are similar on key demographic components (Rendall et al., 2005) such as the age at birth of the first child birth, the number of children per couple or women childlessness rate (Rindfuss et al., 2010) and have a high proportion of women having completed a tertiary education (see Table 1 for detailed national statistics). These characteristics are all expected to result in reducing gender gaps and differences in career trajectories among men and women who remain childless or not. However, despite these similarities, France and Norway differ in several attributes that could impact women who want to have children to get into and then remain in a scientific career (McGuire et al., 2012; O'Brien and Hapgood, 2012). Women in Norway are, for instance, entitled to a much longer maternity leave than their French counterparts (Table1), resulting in longer research pauses when having children. In addition, age at which lecturers or researchers are recruited to permanent positions is notably higher in Norway than in France (see our results below), which may drive women who wish to start a family out of research to a larger extent than in France, where recruitment often occurs before women start a family (Marry and Jonas, 2005). On the other hand, procedures for promotions are more competitive in France than in Norway (Table 1), and French women who start a family may have slower career advancement than men. In addition, the partition of domestic work between men and women remains more unbalanced in France than Norway (Winqvist, 2004), which could limit time spent working for women in France. Comparing Norway and France therefore provides a way to understand whether high family benefits and ease of access to preschool childcare are enough to help women to pursue a successful career, or if other subtle country-specific processes, at home or in the workplace, impede a better work–life balance for women in academia. We therefore primarily focused on the career consequences of time-use inequalities both in the workplace (time allocation to teaching, research, administration and other tasks) and in the private sphere (involvement in domestic tasks and parental care; Jolly et al., 2014; Toren, 1993), thereby examining the 'temporal equation' (Grossin, 1996) of male and female researchers.

Table 1. General statistics of the welfare benefits, employment and education levels and demographic variables for French and Norwegian general populations and details about promotion procedures in Universities and in Research Institutes in sciences.

Variables	France	Norway
Public spending in family benefits (%GDP) [1]	3.6	2.9
Percentage of children 0–3 years in care [2]	48	54
Percentage of children 3–5 in preschool [2]	100	96
Mean age of women at birth of 1st child [3]	28.1	28.6
Fertility rate [4]	2	1.8
Childlessness rate (age 40–44, post 1960 cohorts) [5]	Women: 12% Men: 22%	Women: 12% Men: 17%
Number of weeks with paid parental leave [6][7]	Women: 16 (36 from child 3) Men: 2 (11 consecutive days), from 2002	Total of 49 to 59 of which 10 compulsory for each parent (men: increased from 4 weeks in 1993)
Percentage of people in employment working part-time [8]	Women: 22.2% Men: 6.2%	Women: 28.8% Men: 11.3%
Percentage of adult with a tertiary education [9]	Women: 29.7% Men: 26%	Women: 37.6% Men: 28.7%
Percentage of unemployment (with tertiary education) [10]	5.7%	2.5%
Procedure for being promoted to a senior position (Senior researcher in research institutes, or Professor at University)	Need vacant positions to be opened (locally at university, at national level at the research institute). Lecturers and junior researchers can apply provided they have the "habilitation" (a PhD like degree for experienced researchers). A local (University) or national (Research Institute) committee decides on the appointment through a comparison of applicants CV and performance during an interview.	At university: Promotion can occur on the basis of individual research competence and teaching experience irrespective of vacant professorships, or through applying to vacant positions. A committee is appointed by the university to rule on the promotion or compare applicants CV and performance during an interview respectively. At the research institute: Eligibility to promotion is based on a points system acquired through publications and involvement in the institute.

[1] OECD 2011 Doing better for families (p.42) – statistics for 2007. www.oecd.org/social/family/doingbetter.
[2] OECD 2014 Family Database – statistics for 2010. http://www.oecd.org/els/family/database.htm.
[3] Eurostat 2015 – statistics for 2013, http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do.
[4] WorldBankData – 2014. http://data.worldbank.org/indicator/SP.DYN.TFRT.IN/.
[5] Miettienen et al. (2015) Increasing childlessness in Europe: Time trends and country differences. *Families and Societies* 33: 1-66.
[6] Official text on parental benefits on the French Public Service website: Women –https://www.service-public.fr/particuliers/vosdroits/F519; Men – https://www.service-public.fr/particuliers/vosdroits/F583.
[7] Official text on parental benefits on the Norwegian Labour and Welfare Administration website: https://www.nav.no/en/Home/Benefits+and+services/Relatert+informasjon/parental-benefit.
[8] OECD 2016 Part-time employment rate (indicator). doi: 10.1787/f2ad596c-en.
[9] Report on "The current situation of gender Equality in France – Country profile 2013" and "The current situation of gender Equality in Norway – Country profile 2013" based Eurostat Labour Force Survey 2012.
[10] Eurostat 2015 – statistics for 2015: http://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics#Further_Eurostat_information.
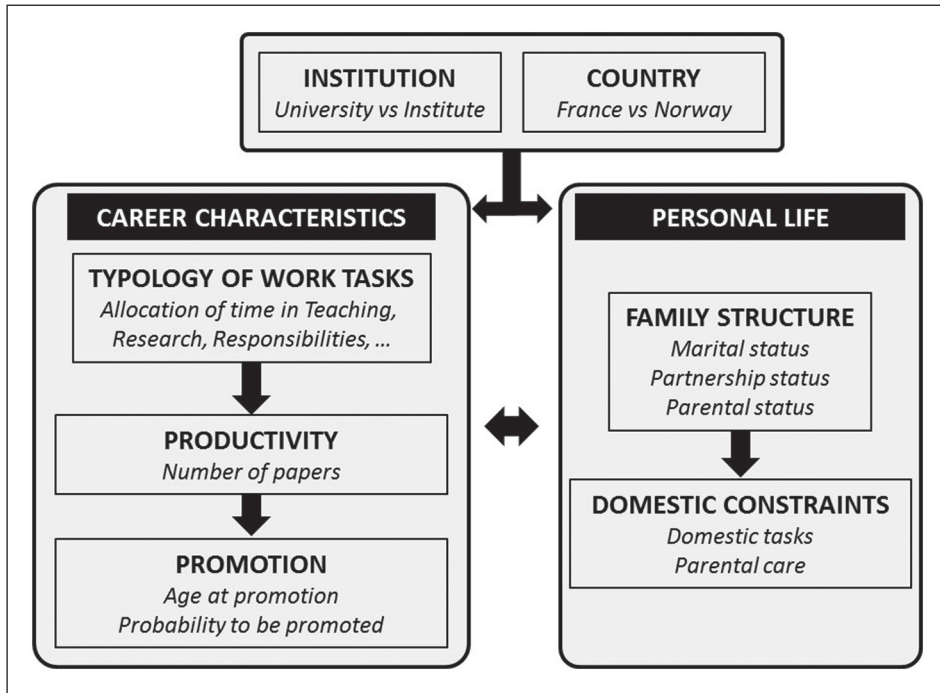
Figure 1. Schematic representation of the variables analysed in this study.

We investigated researchers in ecology, employed either by a university (with a compulsory teaching load) or by research institutes (with no compulsory teaching), where glass ceiling patterns have already been documented (e.g. Kyvik, 1990 (in Norway); Sabatier et al., 2006 (in France)). Ecology is a field of research where both empirical and theoretical approaches are adopted, and where researchers face contrasted time constraints depending on their involvement in field work. Ecology is also a field where the questions of gender gap have been repeatedly addressed by ecologists themselves (Langenheim, 1996; McGuire et al., 2012; O'Brien and Hapgood, 2012; Primack and O'Leary, 1993), maybe because differences between sexes is a pervasive topic for research in ecology and evolution (Darwin, 1871).

After providing some preliminary figures from our data set, we reported our analyses in three steps. First, we identified a typology of time allocation at work based on the relative allocation to the tasks a researcher has to perform during her/his career ('Typology of work tasks', Figure 1), such as teaching and research, but also administrative work, and other responsibilities. We expected strong structures according to the position held by the respondent (with juniors expected to bear fewer responsibilities than seniors, and lecturers to have heavier teaching loads than researchers), by country (with Norwegian academics expected to have a lighter compulsory teaching load than French ones) and by gender (with women expected to be involved more in teaching responsibilities and men more in administrative responsibilities). Second, we explored two aspects of the personal life of researchers ('Personal life' box, Figure 1) that could impact their professional advancement: involvement in domestic tasks and involvement in parental care for researchers with different work positions in the two countries (inequalities expected to be lower in Norway than in France; Winqvist, 2004). Finally, we analysed gender inequalities in the unfolding of the academic career

(chances of promotion, age at promotion), accounting for family structure, and involvement in domestic tasks and parental care ('Productivity' and 'Promotion' boxes, Figure 1). Given that the bottleneck to obtain a promotion is narrower in France than in Norway due to different procedures of promotion (Table 1), we expect a lower chance of promotion for women having children, which has been shown previously to impact productivity, in France than in Norway.

Method and data production

We analysed the answers to an online questionnaire we sent to researchers in 10 laboratories in France and eight laboratories in Norway with the approval of the head of the laboratories, where women accounted for 34% and 23% of the targeted researchers, respectively. In total, 371 persons completed a valid questionnaire (162 in Norway – 46% return rate, and 209 in France – 51% return rate). Of the valid questionnaires, 32% have been completed by women (55% return rate) and 68% by men (47% return rate). All respondents had permanent positions and worked in the field of ecology or evolutionary biology. For the sake of readability, variables are mentioned with a capital letter at the start of the word and are defined in Table 2. The questionnaire included factual questions about personal and career trajectories. Personal situation was described by: Gender, Age, Marital status (Single vs. Couple), Partnership status (partner employed in research or in other sectors), Parental status (having children or not). Professional situation and history included questions about: Age at PhD award, Age at recruitment and Promotion (if any), Working Part- or Full-time. Current position was defined by a Seniority component (Junior vs. Senior) and by an Institution component (University vs. Institute). Another stream of questions allowed us to study more specifically temporal practices at work (Allocation of Time to Teaching, to Responsibilities of Teaching, Administration of Research, Allocation of Time to Common Tasks, and Research Tasks) and temporal practices in the family and personal spheres (Domestic tasks, Parental care).

We first analysed time allocation at work (Figure 1), focusing on the proportion of time allocated to Research, Administration of research, Teaching, Teaching responsibilities and Other Responsibilities. Respondents could choose among five categories: None, 1–25, 25–50, 51–75, >75, which were further transformed into a quantitative variable, 0, 12, 37, 63, 75, respectively. This allowed us to calculate the average time spent in each activity by Country, Gender and Seniority level. For a global vision of allocation of time among different tasks, we performed a between-group Principal Component Analysis (PCA) (Dolédec and Chessel, 1987) to identify which variables best explained the different allocations of time between Gender, Position and Countries. Then, focusing on the three variables explaining most of the variation of time allocation, we analysed the effects of Gender and Seniority and their potential interaction on the proportion of time devoted to Research, Teaching, and Common tasks. Given the strong 'Country' and 'Institution' differences (see results), we replicated the analyses by Country and by Institution.

The gender effect mostly occurred for respondents from University (see results). We thus analysed this group in more detail, using ordered multinomial models with the raw categorical answers for Research, Teaching, and Common tasks. Again, we tested for the main effects of Gender and Seniority, including their potential interaction in both France and Norway. Models were compared using Akaike Information Criterion (AIC). We selected models with the lowest AIC value, based on the parsimony principle as recommended by Burnham et al. (2010).

Then, we analysed two specific aspects of domestic life (Figure 1, box 'Personal life'), involvement in household tasks (Shopping, Home chores and Meals) and involvement in parental care (Transport of children, Homework, and Other care). Respondents could choose among five responses corresponding to 'Only someone else, Mainly someone else, Equal, Mainly me, Only

Table 2. Description of variables used in the statistical analyses for describing personal and professional life trajectories. The name of the variables is indicated with capital letters in the text as in the second column. The third column specifies whether the variable is continuous or if categorical, gives the name of the different categories.

Descriptors for:	Name of the variable (# of categories when relevant)	Type of variable and categories
Professional	Institution (2)	University; Research Institute
	Seniority (2)	Junior; Senior
	Position (4)	Lecturer (=Junior at University);
	(=Institution * Seniority)	Professor (=Senior at University); Researcher (Junior in Research Institute); Senior researcher (Senior in Research Institute)
Career summary	Year of PhD	Continuous variables
	Year of Recruitment	
	Year of promotion	
Personal attributes	Year of birth	Continuous variable
	Gender (2)	Man; Woman
Personal situation	Marital (2)	Single; In couple
	Partnership (3)	Single
	(nested in Marital)	In couple with a researcher In couple not with a researcher
	Parental (2)	No Kids; With Kids
Time allocation at work	Teaching	"None", "1–25", "25–50", "51–75",
	Teaching responsibilities	">75" (in percentage of time allocated)
	Research	when variable was considered as
	Administration of research	categorical
	Common tasks (5)	Or: 0, 12, 37, 63, 75 when variable was considered continuous
Scientific productivity	Number of papers (5)	"1–10"; "11–25"; "26–50"; "51–100"; ">100" when variable was considered as categorical Or: 5, 18, 37, 75, 150 when variable was considered continuous
Domestic involvement	Participation to domestic chores (5 or 3) Participation to Parental care (5 or 3)	"Only someone else", "Mainly someone else", "Equal", "Mainly me", "Only me"; when variable was considered as categorical Or: "Else", "Equal"," Me"; when categorical variable was simplified to three categories Or: −2,−1,0,1,2 when variable was considered continuous

me', which were further quantified by attributing the values −2, −1, 0, 1, 2, respectively. We added these values for the three criteria for involvement of household maintenance and the three criteria describing involvement in parental care, which provided a range of possible values from −6 to 6. We fitted linear models to test for the effect of Country, Gender, Seniority, Parental, Marital and

Partnership status on these two synthetic indices. We further investigated the covariation among the six variables used to describe involvement in Domestic tasks and Parental care, focusing on respondents who have children and live as a couple, in order to explore whether respondents that are involved in one task (whether domestic or parental) are also involved in other tasks, or on the contrary, if people 'specialize' in some tasks while leaving some others to their partner. We performed a multiple correspondence analysis on the six variables, by reducing the number of categories to three, including 'Else, Equal, and Me', and we assessed how the value of each category for each variable covaried by inspecting the correlation circle.

Next, we focused on career trajectories in terms of Age at promotion and Probability to be in a senior position (box 'Promotion' in Figure 1). We only considered the major transitions in an academic career (i.e. getting a professorship position at university and a senior researcher position in a research institute). Promotion systems differ between France and Norway (Table 1). We first aimed at evaluating the differences between Country, Gender, Institution, Parental, Marital and Partnership status. Age at promotion was analysed using linear models, and probability to be in a senior position with generalized linear models.

Lastly, we analysed variation in scientific productivity (Productivity as measured by the number of papers published), which is of paramount importance for promotion. We tested for the role of Productivity and for a possible interaction between Productivity and Gender on the probability to occupy a senior position. Respondents could choose among five classes of Productivity (1–10; 11–25; 26–50; 51–100; >100 papers published) which we transformed in a continuous variables (5, 18, 37, 75, 150, respectively). Given that Productivity indeed turned out to influence markedly the probability to occupy a senior position, we then further explored whether Productivity (box 'Productivity', Figure 1) varied with Institution, Country, Gender, Parental, Marital and Partnership status, accounting for the number of years since recruitment.

All data handling and analyses were performed with R software (main specific packages used: 'ade4', 'nnet' 'visreg', and 'MASS'; R Core Team, 2013).

Results

Overall profile of respondents

Respondents were on average 5.8 years older in Norway than in France, likely because we focused on researchers with a permanent position. Indeed, the mean age at recruitment is about 6.4 years later in Norway than in France, partly due to a later start and end of the PhD (longer PhD duration in Norway), and a longer time spent on casual jobs in Norway (Table 3).

A majority of the respondents worked full-time, but more women than men worked part-time (women: 9.3% in France, 9.1% in Norway; men: 0% in France, 6.9% in Norway, Table 4). Yet, the percentage of men and women working part-time was much lower than in the general population (Table 1), where 22% and 28.8 % of women and 6.2% and 11.3% of men in France and Norway, respectively, work part-time. Strikingly, only women with children worked part-time in France, whereas in Norway, both men and women with or without children could be part-time workers (Table 4). For respondents living in a couple, men had a partner working part-time more often than women in both countries. The gender difference was, however, most pronounced in France (88.3% of female partners vs. 66.1% of male partners worked full-time, Table 4).

The proportion of respondents >40 who were childless was relatively similar by Gender and Country (slightly less than 20%, Table 3), which is remarkably higher than in the general population for women (12% in both countries, Table 1), but not for men.

Table 3. Main descriptive statistics of respondents by country and gender.

Country	France			Norway		
Gender	Women	Men	Total	Women	Men	Total
Sample size	36%	64%	209	27%	73%	162
Mean age	43.0	44.3	43.9	44.9	51.5	49.7
Age range	29–68	28–76	28–76	29–57	35–69	29–69
At university	60%	40%	72	27%	73%	85
In research institute	28%	72%	117	28%	72%	76
At junior level	40%	60%	127	38%	62%	71
At senior level	30%	70%	82	19%	81%	90
Mean age when starting PhD	24.4	25.0	24.8	29.2	29.2	29.2
Mean age at PhD	27.8	28.4	28.2	33.4	33.5	33.4
Mean age of recruitment	30.4	31.4	31.0	37.6	37.4	37.5
Mean duration between PhD and promotion (years)	12.1	10.0	10.7	5.8	5.0	5.1
In couple	80%	84%	83%	91%	85%	86%
Partner is a researcher	47%	29%	35%	35%	28%	30%
With children[1]	75%	80%	78%	75%	81%	79%
Number of children[2]	1.95	2.03	2.00	1.85	2.50	2.33
Age at first child	31.1	31.1	31.1	32.5	30.9	31.3
Waiting for a permanent position to have a child	62%	36%	46%	6%	5%	6%

[1]Among respondents aged >40, the percentage is 85%, 81%, and 81% for women, men, and overall, respectively in Norway; 80%, 86% and 81% for women, men, and overall respectively in France. [2]Among respondents aged >40, the average number of children is 1.86, 2.59, and 2.40 for women, men, and overall, respectively in Norway; 2.00, 2.29 and 2.18 for women, men, and overall, respectively in France.

The gender and country differences were also strong in terms of parental leave (Table 4). Both the proportion of respondents hardly taking any parental leave (less than 1 week) and the length of the parental leave for respondents taking leave differed by gender and country. Fewer French men took parental leave (44%), which was shorter (3 weeks) compared with women (71% took maternal leave, for 14 weeks on average). In Norway, almost all women took a leave for about 36 weeks, whereas only three-quarters of men took a leave of about 10 weeks. Men and women also differed in terms of having a partner going on parental leave and of the duration of this leave (Table 4). Such gender-specific patterns of leave from both respondents and their partner led men to have shorter interruptions and thereby a weaker impact of parentality on their work compared with women.

A majority of respondents lived in a couple in both countries (86% in Norway, 83% in France). The proportion of respondents living in a couple who have a researcher as a partner was relatively high (about one-third of respondents, Table 3), and more so for women, especially in France (almost half of them declared living with a researcher).

Age at first child was similar in both countries and sexes (close to 31 years of age, see details in Table 3). Women researchers hence had their first child about 3 years later than women in the general population both in France (3.0 years later) and Norway (3.9 years later) (Table 1). Probably as a consequence of the difference in age of recruitment between countries, about one-third of French men and almost two-thirds of French women who had children declared having waited for a permanent job before having their first child, whereas it was the case for only 6% of Norwegian respondents.

Table 4. Work situation and parental leave (for first-born child) of respondent and respondent's partner, by Country and Gender.

Country	France		Norway	
Gender	Women	Men	Women	Men
Own work situation	n=75	n=131	n=44	n=116
Working part-time for all respondents	9.3	0.0	9.1	6.9
Working part-time for respondents without children	0.0	0.0	9.1	9.1
	(n=19)	(n =22)	(n=11)	(n=22)
Partner work situation	n=44	n=85	n=34	n=82
Working full-time	88.3	66.1	76.9	69.0
Working part-time	5.0	22.9	17.0	24.0
Not working	6.7	11.0	5.1	7.0
Parental leave by respondent (1st child)	n=52	n=89	n=33	n=83
% taking less than 1 week	28.9	56.2	3.0	24.1
Number of weeks of leave when taking >1 week	14.4	3.1	36.5	10.4
Parental leave by respondent's partner (1st child)				
% taking less than 1 week	52.9	16.9	15.6	3.9
Number of weeks of leave when taking >1 week	2.0	21.0	11.1	32.2

Time allocation at work

We first identified the covariation among the five variables measuring time allocation at work by Country, Gender, Institution and Seniority. The first axis of the between-group PCA clearly opposed time allocation to teaching and time allocation to research (Figure 2(a)). The second axis corresponded to a gradient of involvement in common tasks. Three main variables defined the typology of time allocation at work: Research, Teaching, Common tasks. As expected, in both countries, researchers working at universities were closer to the teaching end of the time allocation, whereas researchers working at institutes were closer to the research end of this continuum (Figure 2(b) and 2(c)). Positions on the continuum of research tasks differed between France and Norway. In France, junior researchers were closer to the 'low involvement' end and senior researchers were closer to the 'high involvement' end, whereas in Norway, all researchers were close to the 'high involvement' end of the continuum.

In France, the analyses of the effects of Gender and Seniority on Teaching, Research, and Common Tasks revealed that women taught more (b=8.07±3.56, t=2.27, p=0.03, Figure 3(a)) while men were more involved in Common tasks (b=7.24±3.32, t=2.18, p=0.03, and Figure 3(c)). Furthermore, Senior respondents allocated less time to Research than junior ones both at University (b=−8.16±4.38, t=−1.86, p=0.07, Figure 3(b)) and Research Institutes (b=−14.73±3.75, t=−3.93, p<0.01, Figure 3(e)) but were more involved in common tasks both at University (b=15.15±3.60, t=4.21, p<0.01, Figure 3(c)) and at Research Institute (b=9.88±2.42, t=4.09, p<0.01, Figure 3(f)).

In Norway, the only detectable effect was Seniority on Teaching and Research (no effect on time allocated to Common tasks). Both senior men and women at University taught less than junior ones (b=−7.92±3.13, t=−2.53, p=0.01, Figure 3(a)) and senior men and women in Research Institute spent less time doing research than junior ones (b=−17.00±5.01, t=−3.39, p<0.01, Figure 3(e)). We did not find such effect for respondents at University (b=6.51±4.03, t=1.62, p=0.11, Figure 3(b)).

The result that gender mostly matters in France at university for teaching and time allocated to common tasks was confirmed by ordered multinomial analyses (Table 5). These latter, however,
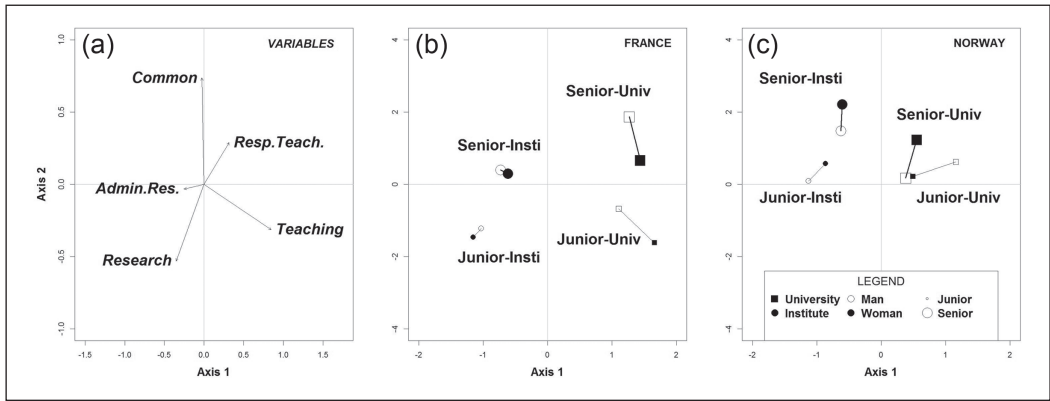
Figure 2. Temporality in allocation of time at work in France and Norway, analysed with a between-groups (Institution, Seniority, Gender and Country) Principal Component Analysis; (a) position of each of the five variables on the first two axes; (b) mean position of groups as defined by seniority, institution and gender in France. Segments pair men and women of the same seniority and institution level; (c) same as panel (b) for Norway. Symbols as followed: circle: Institute; square: University; open symbols: man; filled symbol: woman; small symbol: junior; large symbol: senior.
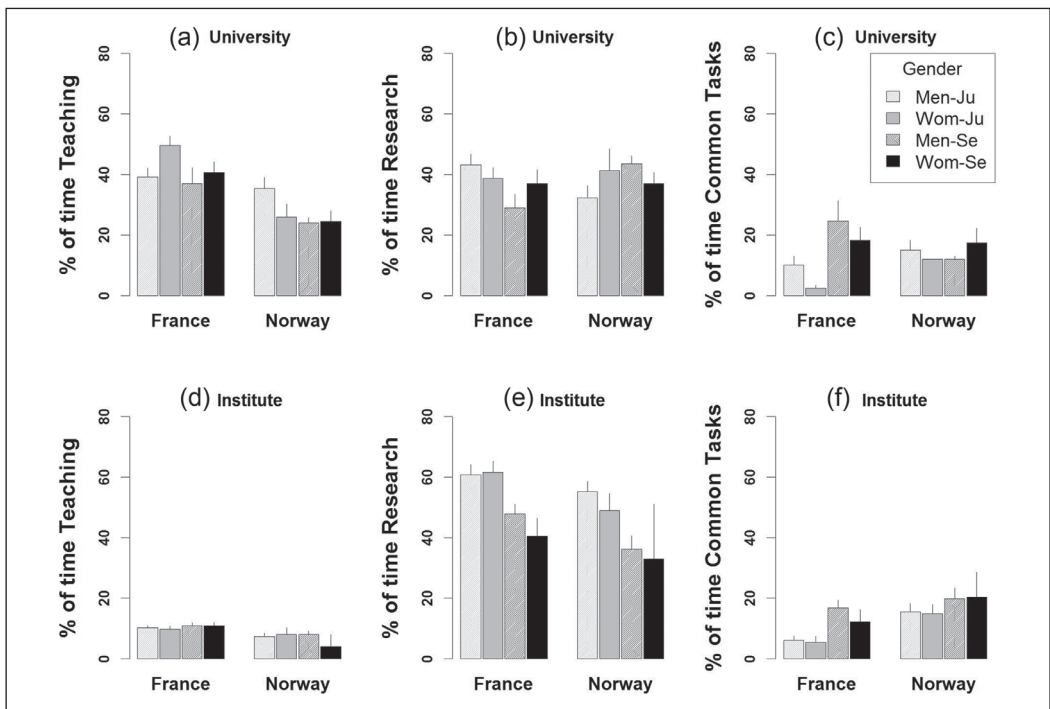

Figure 3. Average proportions (calculated from raw categorical data transformed in quantitative values, see Method section and Table 2) of time spent Teaching (a, d), doing Research (b, e), performing Common tasks (c, f) by Country, Seniority (Junior vs Senior Gender and Institution (a, b and c, University d, e and f, Institute).

Table 5. Multinomial model selection on allocation of time at work to Research, Teaching, Teaching responsibilities, Administration of research, and Involvement in common tasks, per Country (France and Norway), for respondents employed at University. Columns 3 to 7 correspond to the five models including main effects of Gender and/or Seniority and their interaction. Response variables had three categories in terms of percentage of time allocated to each activity (Research: 1–25, 25–50, >50; Teaching: 1–25, 25–50, >50; Common: None, 1–25, >25; Teaching responsibilities: None, 1–25, >25; Administration of Research: None, 1–25, >25). Values in cells give the ΔAIC for each model compared with the model with the lowest AIC value. Models within 2 units of the best model (ΔAIC<2) are in bold characters.

Country	Response variable	Gender * Seniority	Gender + Seniority	Gender	Seniority	Constant
France	Research	2.50	**1.99**	2.82	**0**	**0.88**
	Teaching	**1.13**	**0**	**0.33**	3.10	2.81
	Common	**0.08**	**0**	23.70	2.30	32.02
	Teaching resp.	4.00	2.00	4.77	**0**	2.81
	Research admin.	**0.97**	2.89	**1.96**	**0.91**	**0**
Norway	Research	**1.21**	**1.91**	2.49	**0**	**0.70**
	Teaching	**0.85**	**1.25**	5.33	**0**	3.56
	Common	4.05	3.14	**1.49**	**1.53**	**0**
	Teaching resp.	3.45	**1.46**	**0.01**	1.72	**0**
	Research admin.	3.93	2.00	**0**	2.08	**0.14**

revealed some subtle gender and seniority differences in the distribution of the time allocation to teaching that did not show up in the previous analyses. Indeed, more women than men had a high teaching load, especially at Junior level, and more men than women spent less than 25% of their time teaching at both Junior and Senior levels (Figure 4). Men, in turn declared being more involved in common responsibilities, both at Junior and Senior levels. Although more senior men had a high load of common responsibilities (see above), a larger proportion of senior men compared with senior women spent less than 25% of their time involved in common responsibilities, suggesting that the allocation of time at work may be more contrasted in men than in women. No such gender or seniority effects were detected on teaching, research or common tasks in Norway, even when using ordered multinomial analyses (Table 5). This suggests that the Norwegian academic workplace is fairer than the French one, at least regarding division of labour.

Time allocation at home

Country differences were important for declared involvement in domestic tasks and parental care (Table 6). Given this strong country effect, we analysed the synthetic indices of involvement in Domestic tasks and Parental care separately for each country (see Table 7 for statistical tests). In general, the overall index of involvement in domestic tasks was higher in France than in Norway (Figure 5(a–c)). In both countries, men and women involvement in domestic tasks depended on whether they had children or not (Figure 5(a, b)). In France, men and women had similar involvement in domestic tasks when they did not have children (both genders declaring on average being more involved than their partner), but women were more involved than men when they had children. In Norway, there were no detectable interactive effects between Gender and Parental status (Table 7), although there was a trend for a more pronounced gender gap for respondents without than with children (Figure 5(b)). As expected, in both countries, respondents living in a couple were less involved individually in domestic tasks than single respondents (Figure 5(c)).
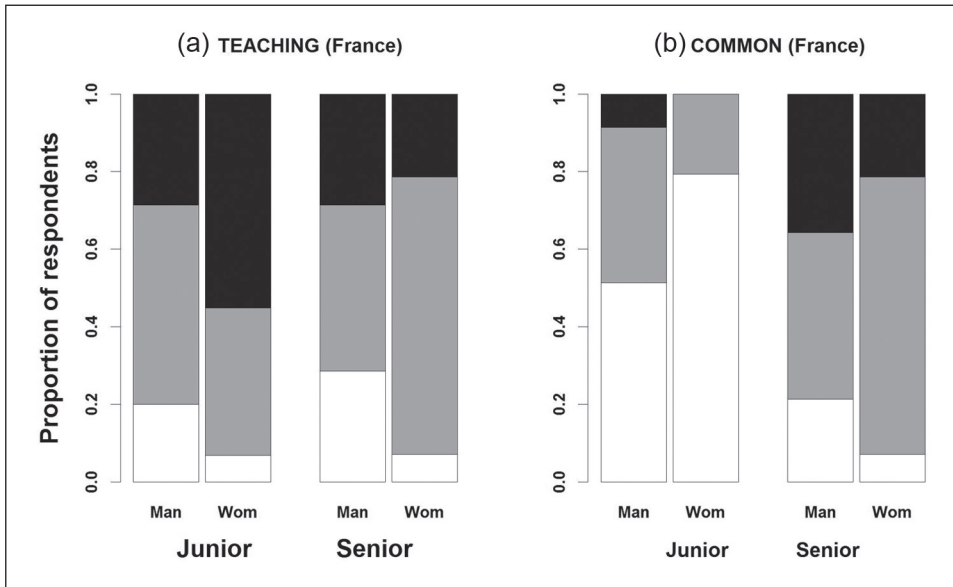
Figure 4. Representation of gender differences in the allocation of time to Teaching (a) and Common tasks (b) for respondents employed at University in France. (a) Gender and Seniority effects on the allocation of time to teaching (1–25: light grey; 25–50: medium grey; >50: black). (b) Gender and Seniority effects on the allocation of time to common tasks (None: light grey; 1–25: medium grey; >25: black).

Table 6. Distribution of responses (Else, Equal, and Me) concerning respondents' involvement in Domestic tasks and Parental care, by Country and Gender (in %). For Domestic tasks, respondents answered three questions about their involvement in Home Chores, Preparing meals, and Shopping, while for Parental care, respondents answered three questions about their involvement in their children: Home work, Transport for activities and school, and Other types of care.

Domestic tasks (*n*=367)		Home chores			Preparing meals			Shopping		
Country	Gender	else	equal	me	else	equal	me	else	equal	me
France	Man	36.8	48.1	15.0	37.9	34.8	27.3	17.1	24.8	58.1
	Woman	6.8	32.4	60.8	20.3	27.0	52.7	23.0	12.2	64.9
Norway	Man	21.4	59.8	18.8	30.5	33.9	35.6	41.9	44.4	13.7
	Woman	9.3	55.8	34.9	23.8	38.1	38.1	23.3	41.9	34.9

Parental care (n=246)		Home work			Transport			Other care		
Country	Gender	else	equal	me	else	equal	me	else	equal	me
France	Man	25.6	60	14.4	18.9	65.6	15.6	32.2	61.1	6.7
	Woman	8.7	43.5	47.8	6.5	56.5	36.96	4.4	41.3	54.4
Norway	Man	14.6	67.1	18.3	13.4	65.8	20.7	20.7	72.0	7.3
	Woman	7.1	50.0	42.9	10.7	64.3	25.0	7.1	64.3	28.6

The involvement in activities related to parental care was strongly influenced by the Marital status and by Gender in both countries (Table 6, Figure 6(a, b)), and also by Seniority (Table 7). The gender effect was strong in France, both for respondents living in a couple and single

Table 7. Statistically significant effects impacting the synthetic indices of involvement in Domestic tasks and Parental care (F, degrees of freedom and p-values from linear models). Effects of Gender, Parental and Marital status as well as two-way interactions were tested on the index of involvement in Domestic tasks (no effect of Seniority detected). Effects of Gender, Seniority and Marital status as well as two-way interactions were tested on the index of involvement in Domestic tasks. "X" denotes the absence of a significant effect.

| Effects	Two-way interaction			Main effects		
Domestic tasks	Gender : Parental	Gender : Marital	Parental : Marital	Gender	Parental	Marital
Norway	X	X	X	$F_{1,158}=7.32$ $p<0.01$	$F_{1,158}=60.4$ $p<0.01$	$F_{1,158}=25.58$ $p<0.01$
France	$F_{1,204}=6.19$ $p=0.01$	X	X	$F_{1,204}=23.90$ $p<0.01$	$F_{1,204}=22.20$ $p<0.01$	$F_{1,204}=36.61$ $p<0.01$
Parental care	Gender : Seniority	Gender : Marital	Seniority : Marital	Gender	Seniority	Marital
Norway	X	X	$F_{1,103}=5.90$ $p=0.02$	$F_{1,103}=4.31$ $p=0.04$	$F_{1,103}=1.78$ $p=0.19$	$F_{1,103}=2.40$ $p=0.12$
France	X	X	$F_{1,131}=4.59$ $p=0.03$	$F_{1,131}=34.2$ $p<0.01$	$F_{1,131}=2.94$ $p=0.09$	$F_{1,131}=27.34$ $p<0.01$
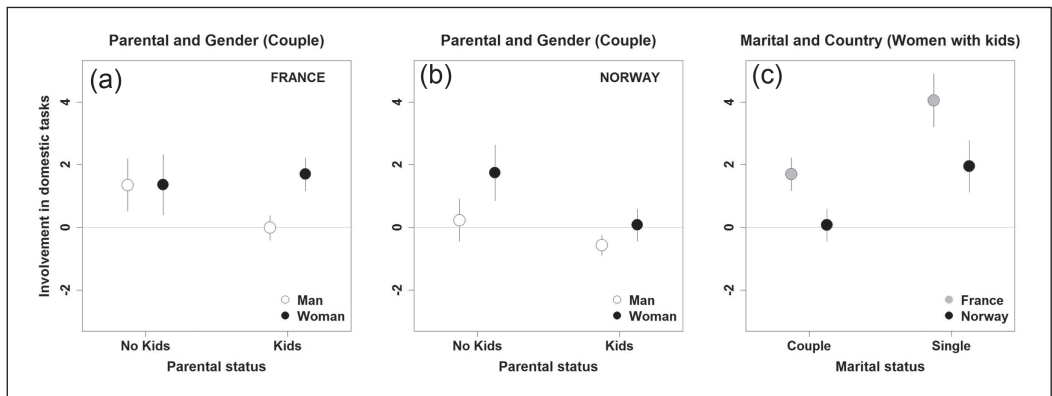
Figure 5. Synthetic index of involvement in domestic tasks depending on Parental status, Marital status, Gender and Country. Each panel shows the conditional effect (with confidence interval) of the focal factors accounting for the other effects retained, based on the models selected as best explaining variation in involvement in domestic task by Country (see Table 7). (a) Interactive effects of Parental status and Gender for France. (b) Interactive effects of Parental status and Gender for Norway. (c) Effects of Marital status displayed for each Country (shown for women with children).

respondents. In contrast, the gender effect was weak in Norway. In both countries, seniority effect had a strong influence on involvement in parental care but only for respondents who were single (most probably because Junior respondents had younger children than Senior ones, Figure 6(c, d))

The covariation among variables describing involvement in both domestic tasks and parental care for respondents with children and living in a couple supported a strong segregation of involvement in all dimensions of domestic and parental duties (Figure 7(a, b)). The correlation circle indeed pooled together the Me, Equal and Else answers of all variables.
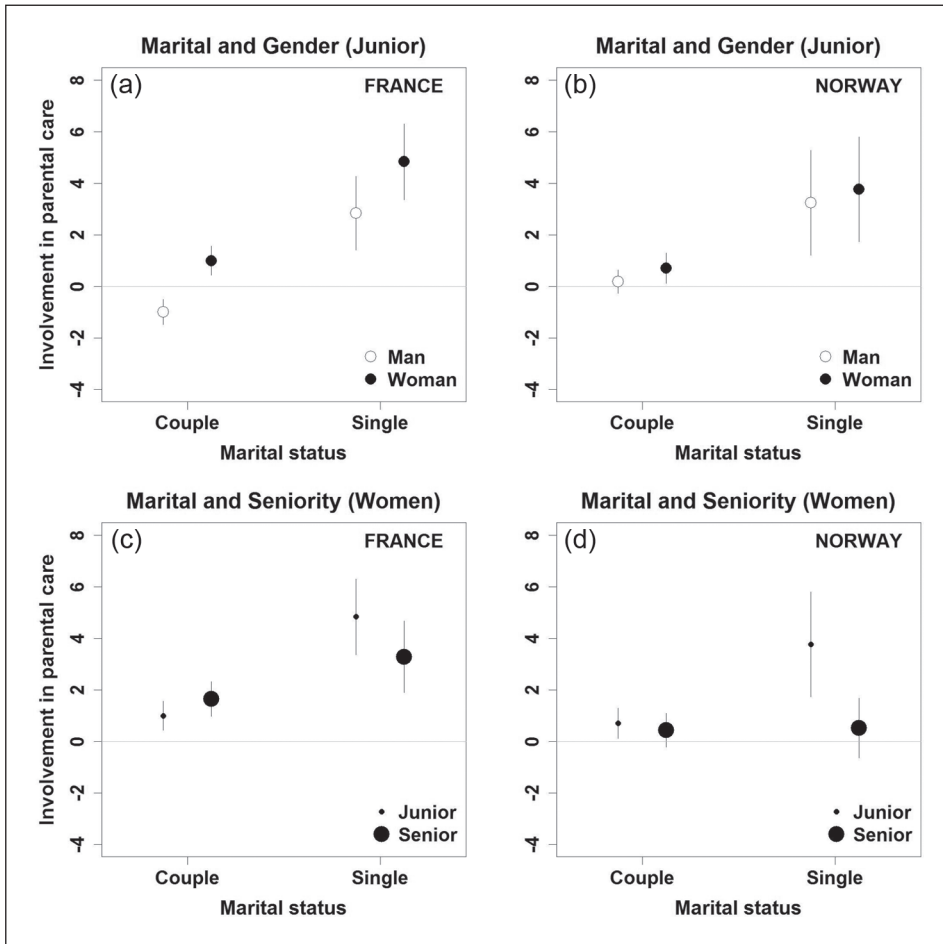
Figure 6. Synthetic index of involvement in parental care depending on Marital status, Gender, Seniority and Country. Each panel shows the conditional effect (with confidence interval) of the focal factors accounting for the other effects, based on the models selected as best explaining variation in involvement in domestic task by Country (see Table 7). (a) Additive effects of Marital status and Gender for France. (b) Additive effects of Marital status and Gender for Norway. (c) Interactive effects of Marital status and Seniority (shown for women in a couple) in France. (d) Interactive effects of Marital status and Seniority (shown for women in a couple) in Norway.

Effects of personal life and institution on gender-specific promotion

We first focused on age at promotion from a Junior to a Senior position, and on whether it varied with Age at PhD, Country, Gender, Institution, Parental and Marital status, and involvement in Parental duties and Domestic tasks. None of the effects of Institution ($F_{1,143}=0.28$, $p=0.60$), Marital status ($F_{1,143}=1.57$, $p=0.21$), Partnership status ($F_{1,143}=0.28$, $p=0.60$), involvement in Parental care ($F_{1,143}=0.32$, $p=0.57$) and Domestic tasks ($F_{1,143}=0.03$, $p=0.87$) had detectable effects (nor any of their two-way interaction with Country, Gender and Parental status, tests not shown here). The effects retained in the model were the main effects of Age at PhD and Country, and interactive effects between Gender and Parental status. Age at promotion increased with age at PhD at the
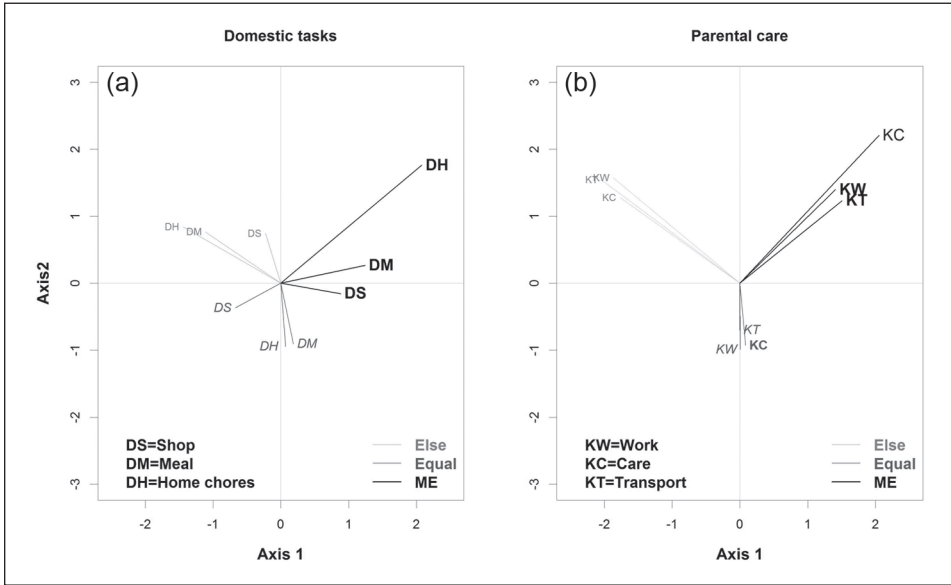
Figure 7. Covariation among variables used to describe Domestic tasks (a) and Parental care (b) including only respondents with children living in a couple. The two panels show the position of each of the three categories (Else: light grey, Equal: medium grey, Me: black) on the same two first axes of the multiple correspondence analyses performed on the six variables (three for domestic tasks – DS: Shopping; DM: Meal; DH: Home Chores; three for parental care – KT: Kid Transport; KC: Kid care; KW: Kid homework).

same rate in France and Norway ($b=0.73\pm0.09$, $t=8.16$, $p<0.01$, Figure 8(a)). This slope lower than 1 (95% CI: 0.55–0.90) indicated that the interval between age at PhD and age at promotion decreased with later age at PhD (Figure 8(a)). French respondents were promoted almost 2.5 years later, for a given age at PhD, than Norwegian respondents ($b=2.48\pm0.87$, $t=2.84$, $p=0.01$). Age at promotion also depended on parental status, but in a gender-specific way (two-way interaction between Gender and Parental status: $F_{1,147}=4.30$, $p=0.04$). Accordingly, men with children were promoted earlier, while women with children were promoted later than their counterparts without children (Figure 8(b)) in both France and Norway.

When analysing the probability to be senior, we tested for the potential effects of the number of years since PhD, Country, Gender, Institution, Marital status, Partnership status, Parental status and involvement in Parental and Domestic tasks with generalized linear models. Three two-way interactions (see below and Figure 9 for interpretation of these interactions) including Gender and Institution ($\chi^2=6.09$, df=1, $p=0.01$), Gender and Partnership status ($\chi^2=8.34$, df=2, $p=0.01$), Gender and Parental status ($\chi^2=6.73$, df=1, $p=0.05$) were retained. Main effects of Country ($\chi^2=23.10$, df=1, $p<0.01$) and Number of years since PhD ($\chi^2=160.00$, df=2, $p<0.01$) were highly significant. Overall, the probability to be senior was lower for a given number of years since PhD in France than in Norway (Figure 9(d)), and as expected, the probability to be senior increased with the number of years since PhD in both countries.

Interestingly, the Partnership status better explained the probability to be senior than the Marital status (Figure 9(a)). The probability to be senior did not depend on whether respondents were single or in a couple, but among the latter, depended on whether they were in a couple with a researcher or not. Being in a couple with a researcher was as positive as being single for men and as negative
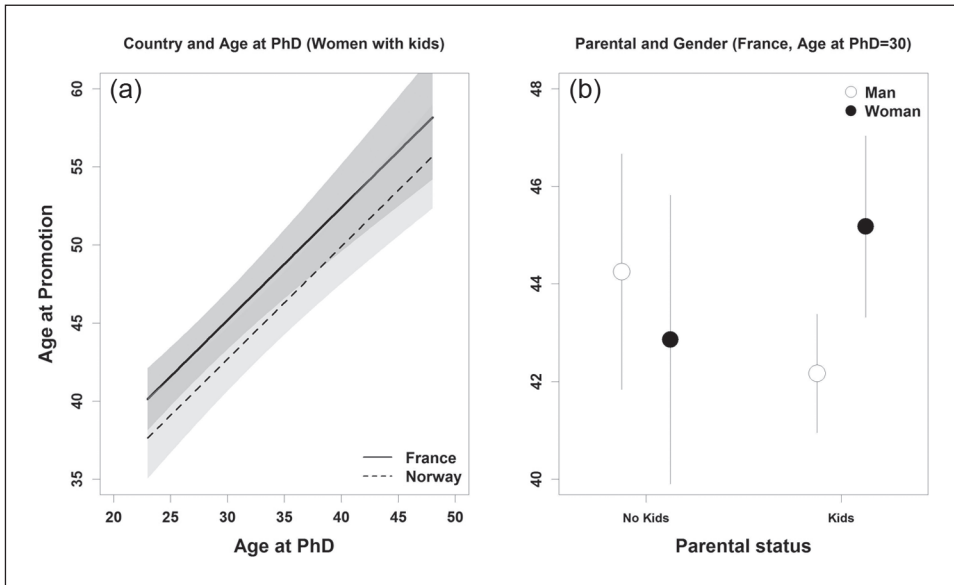
Figure 8. Age at promotion depending on the Parental status, Gender, Country and Age at PhD. Each panel shows the conditional effect (with confidence interval) of the focal factors accounting for the other effects as explained thereafter. (a) Additive effects of Country and Age at PhD (expected values for women with children). (b) Interactive effects of Parental status and Gender (expected values for France, and age at PhD equal to 30).

as being single for women, in terms of probability to be senior. The Parental and Gender interaction (see test above, Figure 9(b)) also clearly showed a divergence of influence of personal life on the probability to be senior. While childless men and women did not differ in their probability to be senior (all other variables being equal), women with children had a lower probability to be senior than men with children (Figure 9(b)).

Involvement in Domestic tasks, Parental care and Duration of parental leave did not influence the probability to be promoted once the other effects were accounted for (all p-values >0.15).

Effect of productivity on promotion

Focusing on the importance of the scientific production on the probability to be senior, we found that the Number of publications (considered as a continuous variable) positively influenced the probability to be senior. The model retained included the Number of publications and also the Number of years since PhD (χ^2=32.10, df=1, p<0.01, Figure 9(d)), and the two-way interactions between Gender and Institute (χ^2=6.68, df=1, p<0.01, Figure 9(c)) and, to a lesser extent, between Country and Number of publications (χ^2=3.53, df=1, p=0.061, Figure 9(e, f)). The effects of Partnership and Parental status were no longer detected when the Number of publications was included in the model, suggesting that the effects of personal life characteristics on the probability to be senior may have transferred through the scientific productivity.

We then analysed whether the Number of publications differed by Parental status, Marital status, Partnership status, Institution, Country and Gender, after accounting for the Number of years after PhD. The retained effects included the two-way interaction between Country and Institution
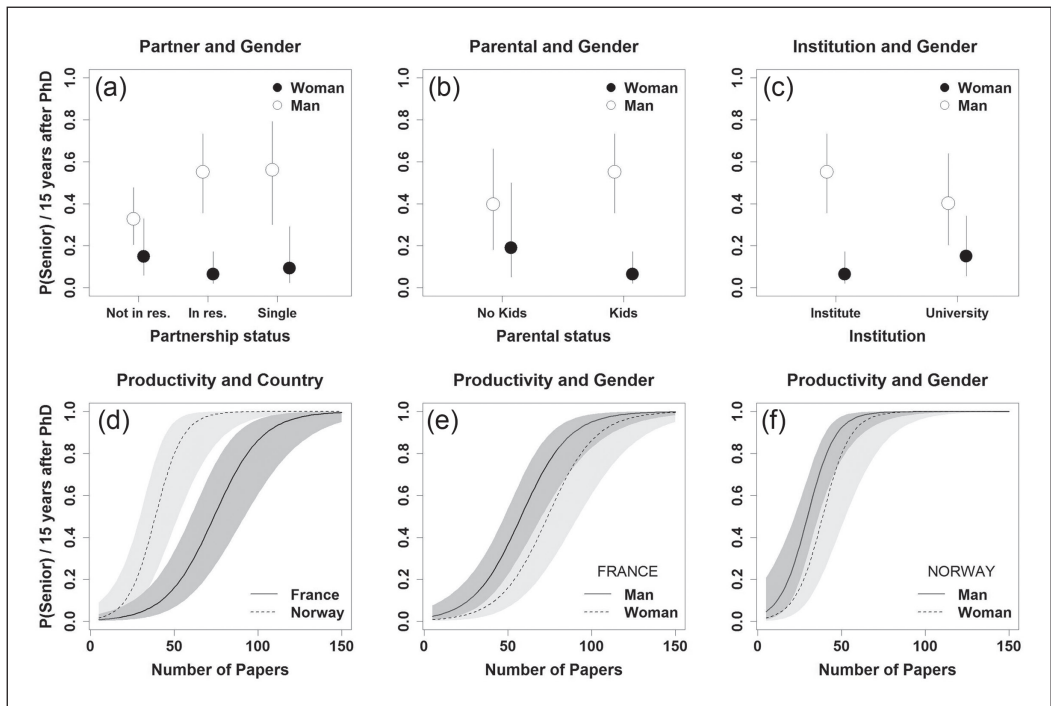
Figure 9. Probability to be Senior (conditional estimates with confidence intervals) according to: (a) Partnership status, and Gender (15 years after PhD, shown for France, Institute and respondents with children); (b) Parental status and Gender (15 years after PhD, shown for France, Institute and for respondents with a researcher as a partner, with children); (c) Institution and Gender (15 years after PhD, shown for France, and for respondents with a researcher as a partner); (d) Productivity and Country (shown for Women working in an Institute – note that in the model including the number of papers, neither partnership status nor parental status matter, see text); (e) Productivity and Gender in France (shown for Institute); (f) Productivity and Gender in Norway (shown for Institute).

($F_{1,348}$=19.92, p<0.01) and between Gender and Parental status ($F_{1,348}$=4.32, p=0.04) with the main effect of the Number of years since PhD ($F_{1,348}$=224.67, p<0.01). The number of papers increased with the Number of years since PhD, similarly in both countries and gender. The Parental status (Figure 10(a)) had no impact on men's productivity (b=1.16±5.17, t=0.22, p=0.83) but had a strong impact on women's productivity (b=−19.14±8.43, t=−2.27, p=0.02). Women with children produced fewer publications. In France, respondents working in institutes had a higher productivity than those at university (b=−25.07±4.43, t=−5.66, p<0.01), while no such difference occurred in Norway (b=6.86±5.45, t=1.26, p=0.21, Figure 10(b)).

Finally, neither involvement in domestic tasks and parental care nor the duration of parental leave had a detectable impact on scientific productivity, for both sexes and in each country (all p-values >0.30).

Discussion

The purpose of our work was to provide an analysis of the gender gap in scientific careers, taking cue from empirical data on academics working in ecology in France and Norway. These two
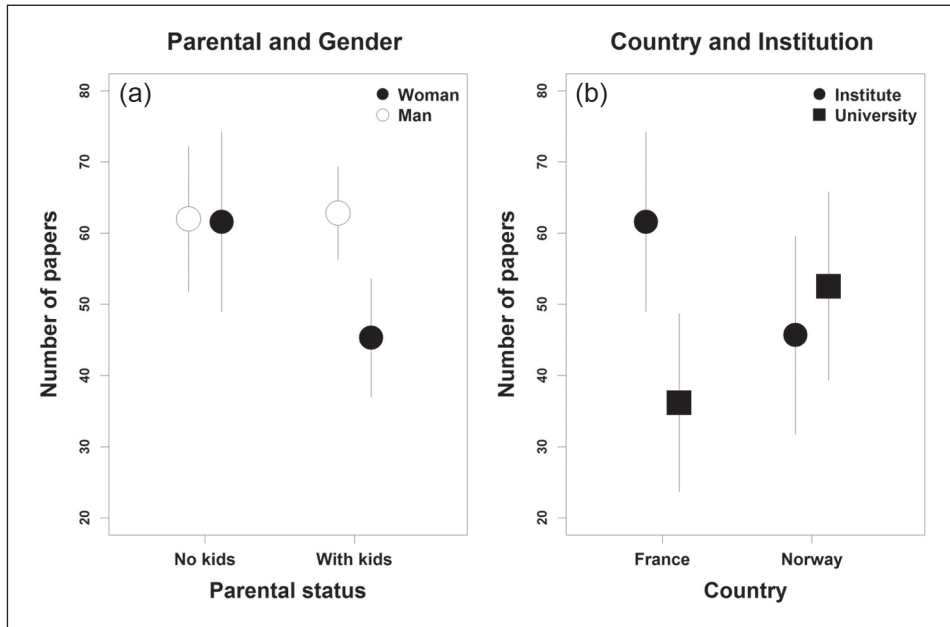
Figure 10. Number of papers (conditional estimates with confidence intervals) 15 years after PhD according to: (a) Interacting effects of Parental status and Gender (shown for France), (b) Interactive effects of Country and Institution (shown for Women, Without children).

countries have some similarities in terms of welfare policies (e.g. high investment for childcare support for preschool children) but also striking differences in terms of duration of parental leave, unemployment level, traditional partition of housework and parental duties, age at recruitment in a permanent academic position, and procedures of career advancement (Table 1), which we expected to lead to different gender gaps in the unfolding of careers. The hurdles for women seemed to occur at different times in the career and due to different processes. In Norway, a relatively lower percentage of women entered a tenured-track position in the first place, mostly after having started a family, enjoying a relatively low imbalance in domestic housework and parental care, and a relatively rapid accession to promotion; while in France, relatively more women entered a research career, mostly before having children, bear a higher part of the domestic and parental duties than Norwegian women, and are less likely than men to get promoted when they start a family. Our main focus was on time-use differences both in the professional and in the domestic spheres, because they have been previously identified as shaping career differentiation (Rafnsdóttir and Heijstra, 2013; Toren, 1993) even to the extent it affects wages (Buffington et al., 2016). Our results support the existence of gender differences in work allocation to teaching (higher teaching load and/or higher investment in teaching activities for women) and responsibilities (higher responsibilities in common tasks for men) at university mostly, and highlight prominent gender differences in age at promotion and probability to be promoted, especially in France. We also show that some of the impacts of personal life on the probability to be promoted were due to differences in productivity resulting mostly from parenthood. This pattern was reported earlier in ecology (McGuire et al., 2012), and in other fields of male-dominated sciences (Ceci et al., 2014 for a review; Mason and Goulden, 2002). Lower productivity of women did not hold true for single women with no children (similar to Wolfinger et al., 2008), pointing

at the complex interwoven relationships between the domestic and the professional spheres (Probert, 2005).

Our exploration of how marital and parental status influenced productivity and career trajectory unveiled complex effects of partnership status and parental status on career dynamics, detrimental to the progress of women with children. We brought to light the contrasted impact on individual career advancement of belonging to a dual-career academic couple, that is, a beneficial effect for men and a detrimental effect for women (Schiebinger et al., 2008; Sweet and Moen, 2004). Further, we uncovered that academics in ecology conform to classical patterns of differentiation of time allocation to domestic and parental tasks (more involvement of women on average), especially so in France where most domestic and parental tasks are carried out by women. Below, we discuss inequalities in workload allocation and career trajectories, and we dwell on the additional roles of institutional and country differences.

Inequalities produced at the workplace

Workload allocation for the main activities carried out by researchers was markedly gender specific (Lockwood et al., 2013). The first and expected difference depended on whether the researcher was employed by a university, with compulsory teaching duties, or by a research institute. The higher compulsory teaching load in France than in Norway accounted for the observed differences in time allocation at work, with a cascading effect on the scientific productivity of researchers at university in France, who had the lowest productivity of all our respondents (Figure 10). Beside this massive effect, we identified a lot of small but statistically significant differences between categories of researchers. For instance, we identified a gap in time-use patterns between men and women holding positions in French universities especially concerning teaching. Men devoted a higher amount of time to research activities and to common tasks than women. The importance of the time spent teaching and responsibilities in some poorly rewarded common tasks, such as committee work, student advising or curriculum development, is often considered as minor compared with productivity in the French system (Pigeyre et al., 2015; see also Henley, 2015 for similar conclusions found in the United States). Therefore, junior women in France suffer from a double penalty in their careers. First their higher teaching load leaves them less time for research and publication, and second they do not invest in tasks that best enhance their chances to be promoted. How and why women invest more than men in teaching early in their career, probably with relatively long-term costs in terms of their scientific output, needs to be investigated further. For instance, interviews with young male and female researchers would be helpful in addition to questionnaires about early career orientation and life–work balance. One hypothesis to explain why women allocate more time to teaching is the better compatibility of predictable duties, such as teaching, with parental care and part-time work. Furthermore, women may be channelled into roles of student guidance through top-down pressure from team leaders (O'Brien and Hapgood, 2012). Norwegian researchers are less concerned by this teaching–research gender gap, maybe because the overall compulsory teaching load is lower. Another gender difference is the high share of working time spent in common tasks by men at the senior level. In Norway, both men and women at the senior level spend more time on average doing common tasks, and less time doing research compared with fellows at the junior level. In contrast, in France this effect is more pronounced for men than for women, both at universities and research institutes, probably resulting from a higher proportion of men having responsibilities as team or institute leaders.

Surprisingly, while we could have expected a larger gender gap in the probability to be senior (for a given productivity and number of years since PhD) at university than in the research institute in France because of the large gender gap in patterns of work allocation at university, we found the

opposite (Figure 9(c)). Factors other than the differentiation of work allocation and productivity are clearly involved in the accession of senior position (Marry, 2008). Studying the relationship between the gender gap and the intensity of the junior to senior bottleneck would be enlightening in this respect (Adamo, 2013).

Researchers were not questioned about the total time spent working. The difference in proportion of time allocated to teaching between men and women could also result from junior women spending less time at work than men, possibly as a consequence of higher time constraints due to the work–life balance when having a family. Their teaching duties might represent a higher share than for fellows able and willing to spend more time working. Alternatively, women might value teaching more than men, a possibility that needs to be explored further.

Inequalities produced at home

Outside the workplace, clear differences between sexes still occurred in the social organization of domestic work. Kitterød and Lappegård (2012) proposed a typology of couples depending on whether they were dual-earners or not, and how they shared duties in the domestic sphere. They unveiled that, in Norway, the 'generalized gender type' (i.e. equal share of domestic duties between sexes) and the 'specialized gender type' (both partners contributing but with a between-sex inequalities of duties) were most prevalent in highly educated partners both working regular hours, most often working in the public sector. Our results on Norwegian researchers support Kitterød and Lappegård's (2012) findings, and further show that respondents were more of the 'generalized gender type' than 'specialized gender type' because we found no evidence of partitioning. No duty partitioning occurred in France either, but the patterns there were far from a 'generalized gender type'. Similarly to McGuire et al.'s (2012) findings when studying ecologists, the sharing of domestic responsibilities (involving home chores, meal preparation, shopping, and also childcare) was highly imbalanced, with fewer men being involved, in France. This gender segregation in duty partitioning might even be greater than the one we assessed from our survey because declaration of involvement in domestic chores is expected to be gender biased (Kjeldstad and Lappegård, 2014). Indeed, men commonly tend to overstate their contribution while women's answers are more reliable (Régnier-Loilier, 2007). Inequalities we revealed in the domestic sphere could be higher than reported from our data, bolstering the fact that gender segregation of domestic tasks and parental care is pronounced for researchers in ecology in France.

In addition, data about partner's status revealed that men live more often in a couple with part-timers, while women live more often with potentially time-squeezed partners (especially researchers), a pattern more pronounced in France than in Norway, and previously reported in similar studies (e.g. McGuire et al., 2012). This indicates that, overall, women bear more duties outside work than men. These results are in line with Jolly et al.'s (2014) findings that female physicians spend about 8.5 hours per week more on domestic activities than male physicians. Finally, we found discrepancies in time devoted to maternity/paternity leave. It was no surprise to find that women take a longer interruption from work than men (studied here for the first child). The consequence of the time taken as parental leave did not, however, have any detectable influence on the probability to be senior, or on scientific productivity. The absence of such effects could be explained by the fact that (1) they are redundant with the gender effect because including a difference between men and women at least partly accounts for such gender differences, and (2) they are limited to the first child, who either is born before recruitment (mainly in Norway) or early in the career, and thereby many years before promotion in France (average number of years to promotion is over 10 years in France). Our results on the divergent impact of belonging to a dual-career academic couple on career advancement show that the devil is in the detail. One has to consider not only whether

researchers are single or not, but how time-constrained and career-oriented their partners are (McGuire et al., 2012; Schiebinger et al., 2008). Women were in a couple with researchers more than men (especially in France), which leads to a slowdown in the advancement of their career. This raises the question of the causes and consequences of gender-specific assortative mating in academia. Our study suggests that having a researcher as a partner is beneficial in terms of career for men only. Schiebinger et al. (2008), however, unveiled that despite the divergent career advancement in researcher couples, both men and women in academic couples find it beneficial, especially through the sharing of networking and understanding of common constraints. The formation of dual-career academic couples clearly needs to be studied further, by also investigating the timing of couple formation compared with recruitment and decisions about parenthood.

The welfare state in Norway encourages women and men to take long parental leaves, though women still take much longer leaves than their partner (Ellingsaeter, 2013). We could therefore have expected stronger country differences in the gender gap in age at promotion or probability to be senior when comparing respondents with or without children. However, the sharing of domestic duties and parental tasks was much more egalitarian in Norway than in France, so we hypothesize here that the higher involvement of men in domestic duties and parental care may have counterbalanced the impact of a long maternity leave in Norway on the delay in age at promotion compared with men when having children.

Noticeably, a higher proportion of women (but not of men) in research than in the general population remained childless, which could be either a choice of women who do not want children to engage in research, or be a consequence of a postponing the start of a family to the point of never being able to do so, or of the perceived incompatibility of research and family life for some women (Marry and Jonas, 2005). Remaining childless is certainly associated with a greater chance of a successful career (promotion-wise) for women in both countries studied, but whether it is combined with a harmonious work–life balance needs to be explored to a deeper extent.

The mediating effect of productivity on career advancement

As reported in previous studies (e.g. Henley, 2015; Stack, 2004; Xie and Shauman, 1998), we found that career advancement was highly dependent on scientific productivity. Women tend to be disadvantaged compared with men, especially when they are mothers. Unequal home organization and unequal allocation at work to less-valued tasks are two recurring patterns recognized to lead to a double jeopardy for women (Holt and Webb, 2007), even though our relatively simple indices of involvement in parental care and domestic tasks were not retained in our best model describing observed variation in scientific productivity. Scientific productivity thus largely acts as a mediator between a process of task differentiation both in the professional and personal spheres, and results in a process of career differentiation (O'Brien and Hapgood, 2012).

While scientific productivity is obviously of paramount importance for career advancement and is influenced in a gender-specific way by parenthood, other processes are likely at play to produce the observed gender gap in the probability to be promoted. Men were more often in a senior position than women, even for a given scientific productivity, though this effect was weak, especially in Norway. In France, such a disadvantage of women, corrected for gender differences in scientific productivity, had previously been reported in life sciences (Marry, 2008), and calls for deeper investigation of criteria used in the evaluation of careers (Henley, 2015). For instance, higher promotion chances for men could result from a higher allocation of men in tasks associated to common responsibilities (team leader, for instance), which may also be valued during promotion procedures. Other recent studies support that, once productivity and family structure are taken into account, the gender gap in promotion process tends to weaken or disappear (e.g. Ceci et al., 2014).

This reinforces the idea that differences lie at least partly in how men and women solve the time equation imposed by work–life balance decisions. Though improving (McGuire et al., 2012), current evaluation procedures are still detrimental to the career of women who want to balance work with a family life (Seierstad and Healy, 2012).

Issues of recruitment and country institutional differences

The sex ratio of the researchers sampled was clearly male-biased because more men than women are employed at university and research institutes, both in France and Norway (34% and 23%, respectively of ecologists are women, see Methods section). This bias cannot be explained by different return rates as they were satisfactory and relatively similar for man and women. The relatively low proportion of women can itself be interpreted as a 'glass ceiling' effect taking place in earlier stages of researchers' careers. The lower proportion of women both among researchers sampled and among respondents in Norway compared with France raises the question of the attrition of women between PhD and recruitment in Norway. The period between PhD and recruitment is a critical transition period during which career and parenthood decisions are likely to be in conflict, which explains inequalities observed in earlier stages of the academic career (Adamo, 2013; Barbier and Fusulier, 2015). In Norway, it is a challenging issue to understand why so few women are recruited as permanent researchers (Ellingsaeter, 2013). This pattern is part of the so-called 'welfare state paradox' because women in academia remain few, despite good conditions for maternal leave and return to work and weak segregation at home (Ellingsaeter, 2013; Seierstad and Healy, 2012). Hypotheses proposed to solve this paradox include the relative timing of age at first child and recruitment, and the highly competitive nature of recruitment into a permanent position in academic research (Adamo, 2013) compared with other highly qualified jobs, especially in Norway where unemployment for highly educated people is particularly low. Although testing the importance of the timing of child birth compared with the major event of a career would have been possible with our data, the power of such analyses would have been limited due to the low sample size. As we have targeted most ecology departments in the major Universities of Norway (Oslo, Bergen, Trondheim, Tromsø, Aas, Evenstad), we hit there the limit of working with gender issues when the sex ratio is strongly imbalanced, such as in ecology in Norway.

Conclusions and perspectives

Our analyses open three main perspectives and lines of thought. First, ecological research is a field in which research topics (e.g. biodiversity, evolution, urban ecology), approaches (e.g. experiments in labs, observation *in natura*, conceptual developments), kingdoms (e.g. animals, plants, fungus), ecosystems (terrestrial, freshwater, marine) and levels of organization (e.g. cell, individual, population) are especially diversified. Our data included information on these issues that was not treated in our analyses. Further studies are needed to assess whether these partitions among topics are gender structured and whether they can account for some differences we observed in research productivity and career advancement. More specifically, the strong reliance of many researchers in ecology on field work, which requires repeated absence from home, often for several consecutive days, has been suggested to be a supplementary challenge for women who want to combine work and family life (McGuire et al., 2012). Such constraints could contribute to the attrition of women after they have been recruited, but could also to lead some PhD students not pursuing a career in this field. In addition to broad national or comparative studies (i.e. comparing fields of research, such as Ceci et al., 2014; Stack, 2004), we call for an in-depth investigation of within-field causes of attrition of women between PhD and recruitment and further from junior to senior positions.

Second, we demonstrated broad gender-specific patterns of inequalities, to different extents, in both professional and domestic spheres, but within each gender, we highlighted the large variability of trajectories. For instance, the proportion of senior men in France declaring having a very high teaching load was nearly as large as the proportion of senior men declaring having a low teaching load, which indicates a diverging typology of time allocation at work within this group. In France, where the promotion to senior level is a competition, some men, as well as women, never manage to achieve senior level. At the same time, there are some successful women (though few, Marry and Jonas, 2005). Cross-sectional snapshots of career and personal life characteristics are limited for understanding what determines the professional trajectories and for identifying the bifurcations among 'success', satisfaction or frustration at work. Studies aimed at getting longitudinal information (Fusulier and Carral, 2012) are badly needed in this respect, to set up strategies to survive the 'academic jungle' with a satisfactory life–work balance (O'Brien and Hapgood, 2012).

Finally, the comparative results between France and Norway raise the problem of the structural effects of national career systems and their specific rules. It seems that the Norwegian context, where access to tenured positions is late, is disadvantaging women (especially those who have, or intend to have, children) who would like to enter into research permanently. In France, promotion criteria tend to favour people who have maximized scientific productivity without accounting for time devoted and success achieved in lesser-valued activities (such as teaching, Musselin and Pigeyre, 2008; Revillard, 2014; see also O'Brien and Hapgood, 2012 and Henley, 2015 for a discussion of measuring success for researchers employed in universities). Organizational responses to gender-related career inequalities often involve developing monitoring systems for comparing promotion rates between men and women. One interesting question, however, is whether research policies affect the valuation of the different academic activities, and thereby the evaluative criteria used by promotion committees. A number of studies (Paye, 2016) suggest further enquiry on this issue is needed.

To conclude, even in two countries with active policies for helping woman to combine working and family life, the gender gap in academic research remains relatively large. The causes of such gaps are manifold, and lie both in the workplace, in the general society and at home. The effect of starting a family has more consequences on the unfolding of a career for women than men in both countries, but for different reasons: in Norway probably because starting a family, with the long period of associated maternity leave, channels women out of research before applying to a permanent position (resulting in a low proportion of women obtaining tenured positions), and in France because once having a position, it decreases chances to be promoted quickly (resulting in women with children having tenured position to be promoted later than men). The issue of timing between recruitment or promotion and age at which women start a family had been emphasized as a possible cause of differential attrition of women in life sciences and medicine (Adamo, 2013), and should definitely be investigated with long time series and comparative approaches (e.g. among countries and fields of research). The timing of recruitment, the partition of domestic and parental duties, the early career allocation of time into different activities at work, and the overall teaching load, are all potential major drivers of career divergence between men and women, the relative importance of which needs to be explored further at the within-country and between-countries levels, accounting for changes that have occurred in family welfare policies in the last decades.

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Individualized sex equality in transforming Finnish academia

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Abstract
This article examines the equality agenda in the context of Finnish university reform in the 21st century. In Finland, the academic regime went through an organizational transformation after the Universities Act in 2009. However, little attention has been paid to the questions of sex or equality. Since the policy influences on equality in education and work are increasingly transnational, this article also observes the role of gender mainstreaming in universities' equality agenda. The appearance of sex equality is analysed through a variety of documentary materials. The findings indicate the balance between higher educational demands and tightening requirements on equality promotion. Equality work, as a part of human resources, is seen through legislation and provides common good and market advantages. The aims seek to ensure similar treatment between individuals and case-specific anti-discrimination, separating spheres of academic work and private life. The focus is on subjective rights on economic rewards and career opportunities. Yet, confused by the abstract principle of gender mainstreaming, the individually oriented view diverges from the traditional Nordic equality model. The study suggests an evaluation of key concepts and assumptions of equality politics in higher education institutions.

Introduction

The ideal of equality has a strong tradition in Finland, especially in terms of education and work. Along with Finland's Nordic neighbours, equality has been the cornerstone of the welfare state and a part of mainstream education and employment policies since the 1960s. However, educational policies are claimed to increasingly follow the incentives of efficiency and profitability at the expense of equality. Yet, the institutional requirements to promote equality have even tightened as a result of amendments to equality legislation and transnational recommendations. Equality as a

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political ambition has not vanished, but its meanings and aims rather fluctuate along with other educational and economic demands.

In this article, I analyse the appearance of sex[1] equality in the official equality agenda guiding Finnish academia. The aim is to describe equality promoted in universities in the 21st century by asking how equality and sex distinctions are understood. The focus is on the conceptions and aims of equality expressed in the policy documents. Universities' equality planning, as an institutionally applied and obliged policy tool, is related to the selected higher education policy documents.

This approach is supported by two indications of the change in the view of sex equality. Firstly, the Universities Act of 2009, and the consequent organizational reforms, transformed the position of universities and personnel in Finland. Due to comprehensive structural and cultural changes, academia is a topical subject of research and universities have been widely explored. However, the perspective of equality politics has been relatively marginal in recent studies, although the organizational changes in universities influence the understanding of justice and equality (Bacchi, 2001). Despite the comments of the national Ombudsman for Equality and some professors (e.g. Naskali, 2009a; Niemi, 2009), questions of sex equality were mainly ignored in pursuance of structural reform as well as in public discussion. Persistent horizontal and vertical sex distinctions[2] in Finnish universities have gained also international attention (UN, 2008).

Secondly, national and organizational equality politics are increasingly transnational. In Finland, the role of international agreements and recommendations in institutionalizing equality and developing equality legislation has been remarkable (Pentikäinen, 2002). Gender mainstreaming, as the latest equality strategy promoted by transnational organizations, targets mainstream gender aspects at all levels and in all fields of education and work. It has, since the 1990s, been on the agendas of the International Labor Organization (ILO), the United Nations Educational, Scientific, and Cultural Organization (UNESCO; Beijing conference, 1995) and the European Union and its member states. It is defined as 'The (re)organisation, improvement, development and evaluation of policy processes, so that a gender equality perspective is incorporated in all policies at all levels and at all stages, by the actors normally involved in policy-making' (Council of Europe, 1998). Besides tightening obligations and practices in the promotion, transnational impacts on vocabulary have revised the cultural interpretations of key concepts. The impact of transnational equality politics in the Finnish university context has not yet been explored.

I begin with conceptual starting points, followed by the current research on equality politics in the context of universities and on gender mainstreaming. The theoretical approach concludes with my research questions. The third section introduces the data and the way in which the content analysis of documentary data is conducted. The analysis describes the ideals, aims and indicators of equality, as well as the appearance of sex in the documents. The fifth section reflects the findings in terms of conceptual shifts and the balance between different demands concerning academia. Finally, I discuss some conceptual and institutional assumptions of equality politics based on the Finnish case.

Conceptual perspectives

Fluctuating equality

The findings are reflected against the conceptual shifts in equality. In the Finnish education policies of the 1960s–1980s, equality was seen as collective 'equality for all' attached to societal, regional and educational equality. Equality between men and women was considered as part of a wider democratization. While the membership of the European Union in 1995 and increasing transnational influences changed the focus towards sex equality, the traditional Nordic idea of collective equality has turned into an individually oriented view (Simola et al., 2002) with

anti-discrimination measures (Svensson, 2006). Fraser (2013) describes the shift from economics and politics to questions of identity and difference as an individualization of equality. In her study on the Finnish equality debate, Holli (2003) also points out that the current debate often concentrates on cultural equality – namely, the *politics of recognition*. This transformation can also be seen as a shift from societal structures towards the inner experience of the individual.

Equality, used as a pervasive concept, is thus approached by recognizing its contested and ambiguous nature. Historically, various meanings have been given to sex equality, which has served to justify even opposing social goals and political decisions (Holli, 2003; Kuusipalo, 2002). Different understandings of basic concepts have an influence on the aims of equality politics (Julkunen, 2009; Laiho, 2013; Rees, 2001). A common way to approach equality in education is to divide its motives into equal resources, outcomes, rights and opportunities (e.g. Aikman and Rao, 2012; Unterhalter, 2005). With regard to the understanding of sex differences behind the policies, the ideological arguments between the sameness and the difference of sexes have been accompanied by the variations of pluralism and intersectionality (Morley, 2010; Svensson, 2006; Timmers et al., 2010).

In Finnish separate legislation for equality and non-discrimination,[3] 'equality', the common translation of the word *tasa-arvo*, refers to equality between men and women. Instead, 'non-discrimination', the official translation of *yhdenvertaisuus*, refers to the principle stating that people are equal despite their personal attributes, such as age, sexual orientation, ethnic background or physical disabilities.[4] While the transnational influences on national and local equality politics have increased, policy implementation and its research have adopted certain terminology that does not translate the same in most other languages. The core concepts, such as *gender* and *equality*, are rather controversial among policymakers, transnational actors and organizations. Of the concepts used in transnational politics, *equality* refers to similar treatment, and even the distribution of resources, while *equity* includes the ideas of justice and cultural values. Transnational actors, such as the United Nations and the European Union, promote the concept of equality in order to exceed cultural definitions (Laiho, 2013). *Gender Parity*, on the other hand, is in use in international equality reports, for example the GPI (Gender Parity Index), to measure distributions of men and women.

Equality politics encountering the transforming academia

The position of Finnish universities was changed remarkably by the Universities Act of 2009. Most of the organizational reforms were in line with transnational directions (e.g. Clark, 2004; Enders and de Weert, 2009; Van den Brink and Benschop, 2012), whose influences have been explicit in Finnish university and science policies since the 1990s. From the perspective of equality aims and promotion, few transformations are under closer observation.

The Act altered the juridical status of Finnish universities, with each university becoming either a public corporation or foundation. This changed the universities' economic situation, confirming the dominance of entrepreneurship and market orientation (e.g. Nevala and Rinne, 2012). Management by results was established by 'ideological change', where universities are seen as centres of innovation and excellence and where the discourse of efficiency, productivity and international rankings has penetrated all of academia (Koski, 2009; National Innovation Strategy, 2008). 'In recent years, universities have been reformed to enable them to achieve the highest international level in scientific research' (Research and Innovation Policy Guidelines, 2011). Productization and the economic pressure on universities have altered the management of human resources (Ylijoki, 2010). The reform transformed the management system and the position of the personnel from the holders of offices to employees. The equality work, on the other hand, is closely attached to human resources.

Equality is not often prioritized during organizational reforms (e.g. Skjeie and Teigen, 2003); conceptions of equality and justice rather adjust along with the transformations (Bacchi, 2001). This indicates the tendency of equality issues to be adapted to other demands that are considered more important (Julkunen, 2009). In addition, the interest in equality in organizations often increases when the rhetoric focuses on benefits and resources (Brunila, 2009). This is seen as opposing arguments based on rights, justice and democratic participation (Squires, 2007). In his analysis of equality statements at different Scandinavian universities, Nielsen (2014) discovered rhetorical differences in the policy documents based on the understanding of equality as a value in itself or as an instrumental tool. At all universities, the promotion of equality was justified by the utility-based arguments and benefits it offers to universities, while other documents draw also on justice-oriented arguments.

As public corporations,[5] employers and educational institutions, Finnish universities are obliged to implement equality legislation. The promotion of equality is regulated by the Equality Act, the Constitution of Finland, labour legislation and, increasingly, by transnational guidelines. Sex equality, in particular, is under close scrutiny; equality plans must be made every few years and sex-related statistics have become more detailed. Amendments to equality legislation have increased obligations to plan, evaluate, measure and report equality. Equality plans must include the following: (1) an assessment of the gender-equality situation in the workplace, including details of the employment of women and men in different jobs and a survey of their pay; (2) necessary measures with the purpose of promoting gender equality and achieving equality in pay; (3) a review of the extent to which measures previously included in the gender-equality plan have been implemented and of the results achieved (Act on Equality, 6§, 15.4.2005/232). Increasingly, equality plans concentrated on sex are being widened along the lines of non-discrimination to include a ban on discrimination based on other traits.

Gender mainstreaming as a transnationalizing strategy

Gender Mainstreaming is a globally accepted strategy for promoting gender equality. Mainstreaming is not an end in itself but a strategy, an approach, a means to achieve the goal of gender equality. Mainstreaming involves ensuring that gender perspectives and attention to the goal of gender equality are central to all activities – policy development, research, advocacy/dialogue, legislation, resource allocation, and planning, implementation and monitoring of programmes and projects. (UN OSAGI, 2009)

In addition to the above principle of gender mainstreaming for institutions, the goals, specifically for higher education and science, are as follows: (1) equal participation of men and women to reduce gender gaps; (2) equal access to education; (3) equal representation of female and male leaders; (4) promotion of women's empowerment, especially in developing a scientific career (ADBG, 2009; UNESCO, 2010, 2013). The original idea behind the gender mainstreaming strategy is to take a different approach to solving gender discrimination in the organization, paying attention to the entire work and structures, based on an analysis of the current organizational situation.

In Finland, the implementation of gender mainstreaming in the university context has not yet been studied. Elsewhere, though, studies have targeted higher education nationally (Gruber and Bauer, 2008; Søyland et al., 2000) using cross-cultural comparisons (Morley, 2007, 2010) and at the level of the European Union (Rees, 2001). In addition, the principles of gender mainstreaming have been observed from the perspective of higher education management, career development (Berggren, 2011) and curricula (Morley, 2007). Overall, studies have widely criticized the effectiveness of the strategy, which is mainly seen as a result of unsuccessful implementation or insufficient understanding of the aims (Daly, 2005; Lombardo and Meier, 2006; Verloo, 2005; Walby,

2005). Countries have been accused of shallow implementation of the policy, as a mere rhetorical change to describe the equality politics already existing.

Conceptual problems have correspondingly gained some attention (Grenz et al., 2008; Squires, 2007), since the ambiguity of the concepts and aims has resulted in weak practical implementation (Morley, 2010). In addition, different understandings of gender have led to different reform approaches (Eveline and Bacchi, 2005). At the same time, gender mainstreaming itself has remained a 'fuzzy' concept, while the lack of its conceptualization has caused confusion and misunderstanding (Booth and Bennett, 2002) and a need to reconceptualize it in respect of gender equality (Bendl and Schmidt, 2013). According to Squires (2007), gender mainstreaming would require reflections on gender, on equality and on mainstreaming itself. In the European Union, for instance, the focus is in mainstreaming equal opportunities rather than a gender perspective (see also UNESCO, 2013).

Neither linguistic nor cultural differences have gained much attention; the common idea seems to be the universal usage of gender and equality across different cultures. The adoption of the Anglo-American interpretation of the policy and its core concepts in another cultural context is a challenge for research (e.g. Grenz et al., 2008). Gender mainstreaming as an equality strategy, after indicating the concrete and political goals, appears rather societally, culturally and historically situated. I bring the ideas of Narotzky (2007) concerning the (hidden) political projects behind the usage of abstract concepts in the context of an institutional equality agenda. The underlying premise is that sex and equality cannot be studied as unrelated factors, but interface with the organizational setting.

Following on from these starting points and theoretical frames, my research questions are as follows.

How does sex equality appear in the equality agenda guiding Finnish universities?

(a)   How are the equality aims presented in relation to equality-related statements in higher education policies?
(b)   How is the principle of gender mainstreaming translated into equality agenda?

Universities' equality agenda as the object of study

In Finland, equality politics is understood as being a part of socio-policies, which are obliged to promote equality in institutions. In universities, this is realized as an official equality agenda based on a variety of equality-related administrative documents. The main documentary data consists of equality plans of all Finnish multidisciplinary universities as the main guidelines for equality promotion,[6] provided by legislation every second year and produced by equality boards. These are related to gender mainstreaming guidelines and to national higher education, university and research policy documents, which are restricted to central reports produced during or after university reform, describing the visions for the development of universities, research and science. These documents are published by the main actors: the Ministry of Education and Culture, the Research and Innovation Council and the Finnish Higher Education Evaluation Council (see the detailed list of data in the Appendix).

Since the purpose is to create a macro-level overview, a typical example, the data is treated and interpreted as a whole and the comparison between individual universities conducted only for apparent differences. Single-equality plans serve as the observational unit, but the unit of analysis is the collection of equality-related documents formulating the common official equality agenda with its expressions, sentences or larger entities. This solution is supported by the observation that equality plans remain substantially similar according to the requirements of the legislation, with

the differences mainly arising from the length and particularity. Citations are included in the text (and in Table 1) in order to illustrate the nature of the data.

Policy documents are interpreted as 'naturally' occurring legal-administrative textual data, materializing the official conception of universities' equality. I understand them the same as Saarinen (2008) in her analysis of educational policy documents. The documents are approached not only as describing something 'really' existing, rather than 'mere rhetoric', but as something for political action and interventions in practice (Ball, 1993, in Saarinen, 2008). In doing so, they create and maintain certain versions and conceptions of equality and justify and direct policy actions. The official equality agenda obliges universities, delimits the interpretation of equality and the space for alternative visions and, by describing the vocabulary and focus of equality promotion, it defines the territory of in/equality. As previous studies have shown, alternative interpretations, based on different starting points and purposes, do exist and lead to different political outcomes in practice.

In order to describe and conceptualize equality promoted in universities, the data was analysed by means of content analysis, focusing on the characteristics of language with attention to the content and/or contextual meaning of the text (e.g. Lindkvist, 1981). Even though the study does not follow discourse analysis as a method, it shares basic assumptions of the language and its consequences on social reality. The purpose of content analysis is to systematically describe and classify the data into categories, in order to provide an understanding of the phenomenon under study (Downe-Wamboldt, 1992). In this study, content analysis is defined as a text-based analytical approach and a tool for systematic reading and interpretation of policy documents. The intent is to restructure the phenomenon and construct the conception of equality in universities. This is based on the coding and classification of text sections, to identify thematic recurrences and by reflecting them on theoretical perspectives, to conceptualize the appearance of equality in the university context.

I proceeded by identifying recurrent expressions and contents in documents. Texts were coded[7] and classified into sections describing the ideal, equal university, what the aims are and for whom, how the equality situation is followed and how sex in/equality is expressed. This was done by data-based identification of the key terms and references, both explicit[8] and implicit. The latter included, for example, mentions of the university as an employer or educational institution, with an assumption of the responsibility of this role, or the opposite arguments (e.g. 'the experiences of inequality weaken the sense of community'). Correspondingly, alternative terms (*equality/non-discrimination/diversity*), synonymous usage of key concepts (*equal/similar, even; inequality/unfair, disrespectful, unjust*), opposites and negations[9] were searched. The references to the target of equality actions were scanned from the sex perspective: how academic employers are seen in documents and on which occasions the sex-related expressions are relevant.

Based on the re-organization of the key expressions and recurrences, I formulated a general type, or 'an average', equality agenda (see Table 1). The analysis was then continued thematically by classifying each of the main themes further. While a great part of the expressions remained abstract, the process of contextualizing and relating them to the implicit assumptions, oppositions and concrete statements,[10] as well as identifying their situational usage, enabled the identification of patterns (Morgan, 1993) and an inference of the underlying meaning of equality and the assumptions behind it.

In order to conceptualize the data and to explore how equality appears and is made comprehensible in the current educational context, themes were analysed in relation to each other and interpreted through conceptual frames of individualization of the Nordic equality model, equality-related definitions of higher education reform and transnational gender mainstreaming. Higher education policy documents were sought for references to equality (or near concepts), which were then identified as to

Table 1. Sex equality in Finnish universities' equality agenda.

	Nature of typical equality agenda (key expressions)[a]	Appearance of equality	Conceptual sex equality
Ideal of equal university	*Equality is a basic right and the aspect of humanity. The university commits itself to build more equal society, wishes to be a forerunner in creating equality and the atmosphere that respects diversity.* *It is a principal of HR in order to promote the well-being. Experiences of inequality weaken social relations and the sense of the community.* *Accomplished personnel and inspiring environment are a key role to success. The structure of the personnel should be well balanced in relation to strategic goals.* *Every member feels they are treated equally and respectfully; equal university guarantees equal treatment in comparable situations* *Discrimination is banned based on the basis of sex, age, religion, ethnicity, physical disability, personal characteristics, etc.*	Legal and moral responsibility; for well-being & personnel development Dependent on economic purposes; promotion of universities' strategic goals of quality and competitiveness; achieving the 'best potential' Equal, fair and respectful treatment (in recruitment and other appointments; based on the same criteria) The ban on discrimination and harassment	Formal obligation, self-evident but abstract, general principal of common good Instrumental case-specific anti-discrimination and individualized similar treatment
Indicators of equal university	*Salary surveys; sex-based statistics of representation; esp. women in different personnel groups; adding men or women where in minority; open positions ought to be sought by equal amount of men and women* *Equality and non-discrimination should be considered at all levels, fields and decisions by taking these questions into account as a penetrating principal in everyday actions; the responsibility for a respectful atmosphere involves every member of the community*	Detailed indicator policy; focus on measuring divisions of sex groups; statistics related to economics and power Mainstreaming as general recommendations; principle of respectful treatment, behaviour and attitudes; everyone's responsibility	Quantitative, measurable, distribution-oriented (of sex groups) Self-evident principle of equal treatment (includes sex neutrality)
Aims of equal university	*Representation of at least 40% of men and women in organizations; even distribution in research and teaching staff, and in duties; to achieve equal pay; increasing the number of women in leading positions* *Equal possibilities for education and professional development, to improve and use competences, to be appointed and participate in the working community; the possibilities of personnel to advance in a career are equally developed* *Equal opportunities for studies are offered for everyone regardless of age or background; to guarantee equally available and accessible environment (facilities, equipment, teaching arrangements, services)*	The similarity of sex groups in relation to working life; internally homogenous sex groups Equal rights to resources, representation, competence development and career advance Sex-neutral employees and abstract individuals; distinction of spheres of life Physical equality, equal conditions; special arrangements on demand, persons with special needs	Equal share of men and women; equal resources (focus on women; sameness of sexes) The subjective rights and opportunities of the individual (non-discrimination, diversity; sex as a personal trait; intersectionality)

[a]Translated from Finnish by the author.

which academic theme they were attached to. I structured the expressions within the formulated equality agenda and compared the classifications. Finally, I outlined the main principles of gender mainstreaming and observed how they appear and are translated at the organizational level.

The approach could be described as abductive, since the focus is on data-based classification developed through conceptual starting points as guiding principles (Cohen and Manion, 1994). By contextualizing the documents into wider transformations of academia, I wished to discover, in the name of equality, what is considered important in organizations. In Finland, equality is commonly considered a self-evident good, but little discussion is made concerning the actual goals of equality, whose equality is promoted, what results are wanted and what the underlying values are. In universities, this means paying attention to the officially produced conceptions of equality – how it is understood and justified – to identify the different policy agendas and ideologies embedded.

The present study is a cross-section into the appearance of equality policy aims in the course of university reform in the 2010s. It focuses on the content and the relationships between the interacting policy agendas based on policy documents, rather than the actual formation of these policy processes or discourses. The article remains on a textual-policy level, aiming to define and construct a common equality agenda for academia. In doing so, the analysis does not cover the rigorous comparison between universities. The frictions between the policy documents and the actual implementation practices in equality work, probably with different solutions between universities, must, however, be acknowledged.

The appearance of sex equality in universities' equality agenda

The equality agenda can be divided into three main sections: the first describes the ideal, equal university and what is regarded as unequal. The second expresses the indicators and actions following the equality situation and the third presents the aims of equality, what is being equalized, especially in terms of sex distinctions. Table 1 summarizes the nature of the documents, characterizing the typical agenda, reduced expressions and interpretations prefacing the reflection. The following quotes are taken from the equality-related documents of universities (translated from Finnish by the author).

Equality as formal, common good and anti-discrimination

This section describes how the equal university and the ideal situation are presented in the equality agenda. Equality work in universities is closely tied to the management of human resources and personnel development. An equal university is seen as 'the best possible working environment for all', emphasizing the common good and equality as a generally supported principle. Equal treatment improves well-being, while 'inappropriate behaviour weakens the functionality of the community and increases the risk of sick leave'. The better working capacity of personnel is important, since an equal environment enables the 'improvement of different talents for the community'. The equality plans highlight the importance of equality actions in achieving the best possible and appropriate workforce for organizational success. Equality ensures the 'high quality and competence of the personnel', while coping in work improves efficiency and productivity. The equality situation is used as one indicator in auditing: 'through the equality plan, we can guarantee the quality of the university'. These quotations indicate the tendency to adapt equality work to the achievement of strategic goals, emphasizing instrumental approach.

Equality appears as a self-evident principle, required by law, but is also considered as a basic societal right. As a visible actor in society, universities take seriously their legal responsibilities and fulfilling formalities, especially in recruitment. In this respect, equality work functions also as

image building, especially towards an international audience. On the other hand, universities commit themselves to promoting a respectful atmosphere in society and reducing sex segregation in working life. Equality is seen as a human dignity, claiming the possibilities of development for every community member, but also more widely attached to principles commonly supported in society, such as pluralism.

Equality-related documents emphasize the requirement of equal treatment to ensure that 'every member of the work community feels they are being treated fairly'. The last quote also includes the idea of fairness as a subjective experience. In recruiting, equal treatment is comparable to similar treatment, since the applicants ought to be compared and evaluated with the same criteria and emphasis based on the merits of their work. Equality as equal treatment is elaborated with the specifications of 'equal treatment in comparable situations'. The situational understanding of equality also appears in the statement 'the equal university does not discriminate against anyone', attached to recruitments or other appointments.

The descriptions of equality problems concentrate on discrimination and (sexual) harassment as well as disrespectful attitudes, treatment and behaviour, such as bullying and favouritism. Following the logic of equal treatment, inequality exists in single-problem situations when a person is mistreated based on his/her characteristics, and is solved case-specifically. Through the amendment of non-discrimination legislation, the equality plans have increasingly widened to include mentions of other bans on discrimination, typically based on age, language and ethnic background or physical disabilities. While 'no one is put in an unequal position according to sex, etc., [or] personal traits', universities should also acknowledge other individual factors, such as learning problems, personal circumstances and motivation.

Gender mainstreaming through indicator policy

Here, I explore how equality aims are materialized and how the equality situation is followed. Since the equality legislation is influenced by the gender mainstreaming strategy and provides a detailed account of the equality situation in universities, this part serves as an analysis of its translation into universities' equality agendas.

Literal to the mainstreaming strategy, equality plans suggest taking 'equality and diversity questions into account as a penetrating and central principle' at all levels and in all fields and actions, claiming up-front evaluation and planning. 'The practices and structures of the administration ought to be developed in a way that the target of sex equality is included in all decision making'. Sex equality is specified to denote that one should be able to develop competencies and make choices without any restrictions of sex. The principle of mainstreaming is thus acknowledged but is presented on a very general level and as a recommendation.

Equality plans relate mainstreaming to the ethical commitment to promote a respectful atmosphere, added to the notion of the responsibility of every community member. Equality as a generally supported moral value is attached to the idea of integrating it into everyday activities, where the principle of common similar treatment is highlighted. This is translated into situational, case-specific resolving rather than 'pre-evaluating gender/equality impact in all policymaking and decisions'. It is noteworthy that here no special importance is given to sex, but to treat everyone respectfully. Thus, mainstreaming does not appear as situating gender equality issues at the centre of policy decisions or as a process framing policies in order to change institutional structures and processes, which contribute to, or sustain, discrimination and disadvantage (UNESCO, 2010, 2013), but rather on attitudes, behaviour and treatment. Higher education policy documents focus primarily on this dimension and interpretation of mainstreaming where equality appears to be self-evident and everybody's responsibility.

The other dimension of gender mainstreaming materializes as detailed requirements for compiling mainly sex-based statistics on distributions and representation. Every amendment of the Equality Act has increased universities' requirements to follow, evaluate and report equality, with equal pay as a central goal. Provided by legislation, universities describe and report their equality situation by quantitative indicators: 'The equality plan includes the report of the university's equality situation provided by the legislation. The report contains the statistical divisions of men and women in different duties as well as the salary survey of wages, pay differences and job classifications'. Indicators include the usage of parental leave, data on the participants in personnel training and grade distributions. In some universities, the level of equality is also followed by surveys on the workplace atmosphere and well-being that include experiences of equality, especially satisfaction with the salary system.

The indicators measuring equality in universities can be classified into the following categories.

(1) *Sex-based salary surveys*: reports of job classifications, wages and pay differences; impact assessments of the university salary system; sex-based distributions of the level of demands and personal performances.
(2) *Sex-based statistics of duties*: recruitment, applicants and appointments to professorships and other positions; temporary employment; research groups; the proportion of women in different personnel groups in particular.
(3) *Statistics on female and male students*: applicants, graduates and the distribution of the sexes in different fields.

Equality, as a measurable and statistically addressable phenomenon, reflects the idea that the degree of equality can be proved by the division of resources and representation. The statistics are added to existing administration reports, usually as a separate section. Here, mainstreaming appears as an indicator policy, requiring comparative measuring between sex groups. According to the numeric understanding of equality, the goal is to achieve more even numbers of men and women, 'at least 40% in governing bodies, committees and working groups', with the special interest to increase 'the amount of women in the leading positions'. The sex is attached to particular questions, especially regarding pay and representation in different committees.

Sex equality as subjective rights for free individuals

This section identifies what and who is being equalized in universities in terms of sex distinction and how personnel are understood in relation to life outside academia.

In equality agenda, sex-related questions appear through sexual harassment and various statistics based on groups of men and women in recruitment, career advancement and salary. Women and men are presented as comparable, categorically homogenous groups, whose inequality is described with the notions of sex groups working in the different fields and hierarchies. The number of women is lower in the leading positions and higher in administration; they are the majority of students and staff but receive lower pay. The solutions offered a focus on encouraging men to enter female-dominated fields and vice versa, paying attention to women's academic careers by encouraging them to top positions and ensuring that 'women have the opportunity to accept more demanding jobs in every life situation'. Conversely, men should be encouraged to use more parental leave. Other target groups mentioned as vulnerable to discrimination are especially those related to accessibility and physical availability.

The equality plans emphasize the same rights and opportunities for men and women in terms of equal pay, professional development, access to positions and duties, an equal career ladder, the use

of skills and expertise, to be respected and to participate in the work community. The vast majority of the requirements for equal opportunities focus on resources and success in academic careers. Equal pay, in particular, has been a central goal of the Equality Act and Equality Programme of the Finnish Government (2012–2015).

In balancing work and private life, the universities differ from one another: some cover it in equality plans while some hardly mention it. Where covered, documents suggest universities consider 'different life situations if possible' – for students, in reference to motivation and flexible arrangements, and for personnel, equal possibilities for parenthood and to act in working life. The recognition of private life is materialized through recommendations: 'Parental leave should be taken into account in the evaluation of the career ladder and working conditions' and 'Employees should not be put in an unequal position in regard to career advance, reward or continuation of employment'. These are followed by the usage of parental leave. Care obligations ought to be supported by flexible working hours and positive attitudes towards different arrangements. With regard to international staff, the integration of their family into the new country is mentioned.

Otherwise, the references to sex are diminished rather than highlighted in documents where the actors are managers, personnel and students described in terms of professional development and accomplished and motivated employees. Sex-neutral language indicates the idea of the similarity of men and women, at least with regard to working life.[11] While work and private life are being separated, equality agendas target the hypothetically abstract individual and employer free from his/her sex and care obligations. The same explicit and transparent criteria guarantee the even-handed and neutral comparison of merits in evaluation and recruitment. The increasing attention to anti-discrimination has shifted the tendency towards joint equality and non-discrimination or diversity plans, where sex appears as one (personal) characteristic among others grounds for a ban on discrimination.

Many equality plans particularize equal study and working conditions as an environment equally available to many kinds of students and from all cultural backgrounds, with regard to facilities, equipment and teaching arrangements. The focus is mainly on physical accessibility and the availability of services, mainly concerning the physical environment but also related to language issues and providing comprehensible information. Here, equal opportunities are defined in terms of organizing services and arrangements for people with special needs (usually with physical disability, e.g. dyslexia). The other case in which affirmative actions, as exceptions to similar treatment, are allowed is the possibility of positive discrimination or favouring male or female candidates in order to balance an uneven sex-distribution (where a minority group is underrepresented with less than 40% and the candidates have similar merits).

Reflection

Above, I have analysed the aims and conceptions of sex equality in the universities' equality agenda, using documentary material. Next, I gather the main findings and reflect them in the light of conceptual frames. I first answer the sub-questions, as they preface the main analytical question and help to contextualize and comprehend equality promoted in academia in the 2010s within the interacting and even contradicting demands.

Balancing out sex equality

The first sub-question asked was how the equality aims appear in relation to equality-related statements in higher education policies. Institutional requirements to measure and report the equality situation are tight and equality work, as part of universities' human resources, seems to be accepted

through established equality boards and planning. The idea of equality, however, does not easily match the discourses of freedom of choice, individual responsibility, excellence and competitiveness increase in education policies (Naskali, 2009b). In universities, this contradiction is solved by integrating equality into quality assurance with indicator policy and claiming similar treatment with the same criteria. In equality agenda, equality promotion seems to be balanced between ethical, right-based principles, strict legislation-based formalities and an instrumental approach. Equality is presented as a moral and legal obligation, connected to general welfare and to the 'common good' of the community, but left abstract. For individual employees, on the other hand, legislation guarantees the ban on discrimination and the right to equal treatment in working life situations.

Equality planning appears in an interesting light given higher education policies' broad reliance on the market economy (Hauhia, 2015) and the repeated vocabulary of quality, effectiveness and international competition. Similar to other organizations, equality promotion in academia is strongly argued to bring benefits and organizational advantages (cf. Brunila, 2009; Nielsen 2014). This was especially the case in higher education policy documents, which unanimously emphasized instrumental aims. In them, equality appears mainly self-evident and achieved as a valuable national advantage and one of the strengths of the Finnish innovation system. The aims focus on improving individual capacities and skills, seeking experts and developing creativity. Documents link sex equality to career development, with the emphasis on international competitiveness and the desire to attract the best workforce to Finnish universities. In the Research and Innovation Policy Guidelines for 2011–2015, equality between men and women – as well as the reconciliation of work and family – is mentioned as the biggest problem in the development of successful and international research careers. The same document highlights that 'women have good opportunities to establish a research career in Finland. Practices must be changed to enable new kinds of recruitment models for researcher couples and their families, as well as other people'.

National higher education policy documents present equality similarly to equal treatment and banning discrimination based on different personal traits. The development plan for education and research (Ministry of Education and Culture, 2012) mentions that 'qualitatively equal conditions for education must be provided for every student despite the location of the institution'. The understanding of equality as more of an individualized phenomenon is seen in these demands for accessibility and availability relating to physical conditions, individual situations and personal circumstances. These documents hardly consider the sexes at all; personnel are seen as workers, experts and talented individuals.

I also asked how the principle of gender mainstreaming is translated into universities' equality agenda. Two remarks are made on the appearance of strategy and its goals for higher education: firstly, claims of gender mainstreaming are realized as separate mentions and recommendations to take equality into account in all actions. This turns into fair treatment and behaviour, which is everyone's responsibility in everyday actions, without a specific sex-reference. Secondly, through strict obedience to the law, gender mainstreaming materializes as detailed statistical indicators. The focus is on measuring divisions and representation of sex groups, prioritizing the even distribution of men and women, the equal representation of female and male leaders and the promotion of women's career development.

Neither of these dimensions follows the expressed principle in gender mainstreaming strategy, since the first is mainstreaming without the sex/gender perspective in policymaking and structural development but at the level of attitudes and behaviour, and the second focuses on sex in particular issues and comparing the sex groups as separate indicators and reporting. In this sense, adopting the applicable rhetoric of the strategy, gender mainstreaming exemplifies the 'weak concept' (cf. Narotzky, 2007). It expresses the tension between specificity and abstraction of concepts, whose

descriptive force lies in their cultural and local specificity. In universities' equality agendas, the definition of mainstreaming and its aims are left abstract and ambiguous. While the policy emphasis also differs between transnational organizations (Squires, 2007), adopting the vague idea of mainstreaming might serve as an easy strategy for institutions.

Conceptual emphasis on individual equality

Finally, I asked how sex equality appears in the equality agenda guiding universities. Equality promotion is attached to fair treatment, behaviour and attitudes, while equal treatment and opportunities are founded on requirements of the same criteria applied to everyone, mainly in recruitment. The emphasis is on anti-discrimination, with equality seen as a subjective right in competence development and career advancement. Claims for anti-discrimination have transcended sex equality to some extent, emphasizing personal differences, thus indicating an individually oriented view on equality. The focus is on cases of harassment and discrimination, whose prevention is highlighted also in equality legislation. The ban on discrimination is mainly attached to physical accessibility and the availability of services.

The findings reveal distinctive understanding of equality at different levels of where equality aims to operate: at the organizational level, equality is harnessed for instrumental advantage and with the support of legislation, followed by quantitative indicators of sex groups. Here, the sameness of sexes is the dominant view. At the level of personnel equality, it is regarded as a subjective right and opportunities focusing on case-specific anti-discrimination between abstract individuals. This view sees sex as one personal trait among others and is thus close to an intersectional approach. Implications for work/life interferences, however, are quite similar in both approaches.

In the first dimension, comparing men and women emphasizes equality as the same share, while equality is understood more as an even resource distribution and as increasing the proportion of men or women in positions or fields where one or the other is in the minority. The focus is especially on increasing the number of women in leading positions. This could be seen as a type of equality of outcomes, if understood as a measurable situation. Morley (2010) pays attention to the tendency of gender mainstreaming to treat gender as universal and men and women as dichotomist, homogenous groups. The differences and tensions inside the groups remain invisible and un-problematized, in relation also to transforming family relations. According to Radcliffe-Richards (2014), the 'only X%' arguments are commonly used as evidence of discriminatory treatment, but it may also depend on actual differences between the groups and their situations.

In the second dimension, the documents tend to obscure sex rather than reflect it, and individual differences transcend the sex-related questions. For Bacchi (2001), this represents the negotiation of the image of equality, where diversity discourse displaces affirmative actions and the attention is moved from the structures and practices affecting the position of certain target groups to the personal rights of abstract and sex-neutral individuals (Naskali, 2009b). These persons are not defined by sex distinctions, different life conditions or responsibilities of care, but should be evaluated with the same work-related criteria, regarded as neutral and objective. Sex distinctions, however, are not only about the individual, if seen as having a concrete form and consequences related to reproduction and care, for instance. The focus on individual differences in the search for maximum potential leaves group distinctions aside. Thus, the rhetorical shifts from equality to diversity might also indicate a perspective favouring the utilitarian viewpoint (Nielsen, 2014).

With the boost from the Equality Act, the equality agenda aims at furthering women's careers and increasing the proportion of women in leading positions. According to the documents, this should be done by encouraging women and promoting their self-esteem. Focusing on individual women's characteristics and their assumed lack of ambition turns the attention away from the

positions as well as the uneven distribution of private life obligations. Separating the private life from the working life places everyone in a situation where using the available opportunities is seen to be dependent only on him/herself. These characteristics, with equal opportunities and similar treatment, are usually emphasized in the liberal view on equality (e.g. Svensson, 2006), guaranteeing a formal equality between the members belonging to the same category. This conception might be more compatible with the search for success and excellence in higher education policies than the equality of outcome.

Remarks from the Finnish case

With the example from Finland, I wish to question some basic assumptions and the appropriateness of current sex equality aims in the transforming academic context and, finally, I suggest some alternative conceptual and practical approaches. Finnish universities' equality planning has witnessed a transformation in the conception and aims of equality in recent decades. This operates in equality agendas, firstly through the strict reliance on legislation, which defines the actions and indicators and thus also the boundaries of in/equality. Gender mainstreaming materializes in amendments and tightening regulations by increasing the indicator policy on sex groups in order to achieve more even numbers of men and women. These aims, however, are somewhat contradictory to the emerging demands of non-discrimination or diversity with the focus on personal characteristics and case-specificity.

Secondly, the Finnish view of equality, combined with social justice, aiming for even, good and equal outcomes in terms of economics and political participation, forms the background for the shifting equality aims and conceptions. The marketization of educational policies, with the emphasis on individual anti-discrimination in work life, has composed a liberal and individualized view but in relation to personal development and top positions, on which the abstract that equal Employees should have similar subjective rights and opportunities. This differs from the traditional 'Nordic model' and collective understanding of equality in terms of economics and participation, which are still not abandoned compared to identity politics (cf. Fraser, 2013). Distributive aims of even share are targeted at resources and representation, while the politics of recognition appear only in expressions of equality as a subjective feeling of being fairly treated and appreciated (cf. Holli, 2003).

The findings also suggest paying attention to conceptual questions when implementing transnational equality strategies in an organizational context. In Finland, the transnationalization in equality politics is present already in the adoption of Anglo-American terms, which in the 1990s, at the latest, started to replace vocabulary in policymaking. This is seen in the term 'gender', which has no specific equivalent in Finnish, and although the word '*sukupuoli*' (half of a kin) does not refer to 'social sex', it is increasingly made identical. Yet, the indicators and statistics measure formal and quantitative equality between the biological sexes, not of gender. As Narotzky (2007) points out, transnationalizing research and policy discourses may lead to them going astray if they are not analysed culturally, while historicizing concepts and indicating concrete goals reveals their situatedness. In this respect, does the implementation of gender mainstreaming with the assumed universal notions lead to deepening confusion, while the actual aims are left abstract? Does it offer an easy strategy to adopt the rhetoric and escape from the reflections of what are the concrete mechanisms that create inequalities between different kinds of females and males in certain organizational contexts?

Despite various equality agendas, sex-based segregation in Finnish universities remains persistent. The example from academia also poses some further questions to policymakers and researchers. Do the changes in work and gendering renew the need to study the appropriateness of current

aims and indicators promoted in equality politics (cf. Radcliffe-Richards, 2014)? While equality goals tend to be separated from academic values and virtues (Jenkins and Hutchison, 2013), they also seem to rely on the expiring view of inequality, distinctive to the academic regime. Even though the impacts of the Finnish university reform could be fully researched, new forms of segregations can be seen (see also Berggren, 2011) due to the casualization and disintegration of employment. Recent statistics indicate that increasingly temporary and less stable positions and periods of unemployment concern women more than men, noticed elsewhere as well (Bagilhole and White, 2013). The equality agenda in academia could apply to any organization, but we can ask whether the legislation-based indicators are capable of recognizing the nature and demands of academic work and related gendering, especially in terms of private life.

Women's underrepresentation in certain fields or positions is regarded as a 'pipeline problem' to be fixed by adding more women. This model is widely challenged by the evidence that it fails to represent the problem (Dodds and Goddard, 2013; Schiebinger, 1999). Instead, studies indicate that conditions differ among and inside the groups of men and women (Currie and Thiele, 2001; Heikkinen et al., 2012), and for most women, their still tighter ties to children put them in a different situation to men (Pritchard, 2010; Radcliffe-Richards, 2014). In universities, as elsewhere in society, women also take more and longer parental leave than do men, thus investing in the domestic sphere. Furthermore, while the emergence of 'caring fatherhood' in Nordic countries inevitably transforms these dynamics, it does not remove the challenges of the private care of dependents. In order to solve the problems concerning the relationship of the sexes, Radcliffe-Richards (2014) called for different approaches and the recognition of the issues that are difficult to characterize in terms of justice and equality. There is a need to pay attention not only to the nature of work, but also to family structures and other societal institutions.

This article targets the policy level and examines the official equality agenda of Finnish academia in the context of the latest university reform. Policy texts form the way of viewing the phenomenon, provide vocabularies and assist universities and, thus, what kind of equality is constructed in documents is not insignificant. The definitions of key concepts and the choice of indicators inform how equality should be used and for what, which goals and problems are foregrounded and which are left aside. The conceptual emphasis, for example between equality and diversity as being more compatible for market orientation and internalization, is a political question that analysis reveals what is considered important in universities. This article asked how sex equality is conceptualized and how its aims are balanced on different, even competing, policy agendas. The surface where these frictions meet is the implementation, the receiving in practice, where the solutions inevitably differ between universities. A suggestion for further study is the 'material turn' (Saarinen, 2008), a dialogue between interacting policy texts and actual practices.

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Notes

1. I use the word 'sex' instead of 'gender' in order to highlight the culturally distinctive ways of using the concepts and to avoid any commitment to the dominant discourses (cf. Radcliffe-Richards, 2014). The Finnish word *sukupuoli* ('half of the kin') lacks the distinction between the biological and the social.

2. Women form the vast majority of personnel in care and educational sciences, while men work in natural sciences and technical fields. Women hold 27% of all professorships. See, more specifically, https://vipunen.fi/en-gb/higher-rd-activity/Pages/Tutkimus–ja-kehitysty%C3%B6.aspx; Women and Men in Finland 2014 (p.31 onwards), http://www.stat.fi/tup/julkaisut/tiedostot/julkaisuluettelo/yyti_wom-efi_201400_2014_10368_net.pdf.

3. Act on Equality between Women and Men 1986 and Non-discrimination Act 2014 (repealed the old one, which entered into force in 2004).

4. In universities' equality planning, the identical Finnish terms ('tasa-arvo ja yhdenvertaisuus') are in use, but the English versions, if they exist, are somewhat varying. The references to both Acts are translated as 'The University plan on equality and parity', 'Equality and diversity plan' or 'Equality and equal opportunities policy'.

5. Except for two universities, which are foundations.

6. Of the 14 universities under the Ministry of Education and Culture, the analysis covers all 10 multi-disciplinary universities and two universities of technology. The University of Arts and the Swedish-language Hanken School of Economics are excluded, since they specialize in economics or the arts and, in addition, the former was founded only in 2013. Separate equality plans were found for all but two universities of technology, which mentioned equality issues in their quality manuals. Due to the dichotomy in Finnish higher education between universities and polytechnics (applied sciences), all universities are research intensive. Despite the increasing political emphasis on specialization and profiling, the apparent differences are still in size and the degrees offered, which enables a common macro-level policy approach.

7. The initial coding was done with the aid of ATLAS.ti software for qualitative data analysis.

8. Expressions such as 'is aimed at', 'creates', 'confirms', 'following', 'committed to', 'to achieve', 'providing', 'meant for', 'in argumentation', 'The equal university is… acts, treats' and 'guarantees' and statements 'Equal university does treat everyone…' for ideals of an equal university.

9. 'where … not occur', 'to remove barriers of…', 'to interfere in…', 'not tolerate…'.

10. 'equal share of…', 'equal opportunities to…', 'equal treatment in', 'even amount of women and men applying for open positions'.

11. One equality plan explicitly mentions 'the different behaviour, efforts and needs of men and women are equally as valuable'.

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Author biography

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Appendix

Sources

Documents guiding the promotion of sex equality in Finnish universities
- The latest equality plans of 12 universities (collected 2014)
- The equality reports and instructions of universities
- The Finnish government action plan for gender equality 2012–2015
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- The Finnish Higher Education Evaluation Council FINHEEC
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- The Research and Innovation Council, Finland
  - Research and Innovation Policy Guidelines for 2011–2015
  - Directions for Research and Innovation Policy 2015–2020

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Equal opportunities in the postdoctoral phase in Germany?

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Abstract

This paper discusses results of a research project on equal opportunities between women and men in the postdoctoral phase in German universities. It illustrates how the funding system is organized and whether this contributes to more equal opportunities for men and women, especially concerning the work–life interference. Although the system loses women after the doctorial phase, equal opportunity is not a core issue in the promotion of postdoctoral researchers in Germany. Instead, it tends to be addressed indirectly via an array of different compensatory support programmes. One key finding is that certain programmes, such as 'coaching', 'networking', 'mentoring' or financial support, are not offered everywhere, and therefore many postdoctoral researchers do not have the opportunity to utilize them. Furthermore, we found evidence of a gender-specific demand for support programmes. Another finding was that work–life interferences in scientific careers are not addressed by support programmes. The organization of everyday life is not taken into account. Given the context of uncertain career paths in Germany and the unequal working conditions of women and men in academia in Germany, it becomes clear that equal opportunities cannot be realized by ignoring the informal and gendered handling of work-life-balance.

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Equal opportunities in the postdoc phase

There are several models or concepts of sequencing the research career (European Commission, 2013). Most of them differentiate between researchers who hold a doctorate ('postdocs') and those who do not yet have their PhD. Firstly, in order to understand what is happening in the postdoctoral phase in Germany with regard to equal opportunities for women and men, we discuss some of our former findings on equal opportunities in the doctoral phase before giving special attention to the characteristics of the postdoctoral phase.

In the doctoral phase, equal opportunities – especially regarding the equality between men and women in science (Deutsche Forschungsgemeinschaft (DFG), 2015) – play a key role in the level of education policy discourses in the last decade; equal opportunities have been, after all, an important research and education policy argument in the discourse around the introduction of structured doctoral programmes since 2000. The expectation of more transparency as a result of the new structures was primarily associated with the hope of more equal opportunities for women (Allmendinger, 2007). In fact, however, there is virtually no reflection on equal opportunities in the applied programmes themselves, for example among those running the programmes (Korff and Roman, 2013), and equal opportunities and gender are even a taboo subject (Baader and Korff, 2015). For this reason, an instrument for the self-evaluation of equal opportunities was developed in our project 'Equal opportunities in structured doctoral programmes at German universities – gender and diversity' (Baader et al., 2013). Many so-called 'support programmes' for postdocs, however, make absolutely no mention of the need for equal opportunities. And yet action is definitely needed here, as the following research findings show.

The phase following the doctorate, the so-called postdoc phase, is, all in all, much less structured than the 'structured doctorate', even if the latter is by no means uniform (Korff and Roman, 2013). At the same time, the postdoc phase can be described as a bottleneck, where women leave the academic system in greater numbers. This is illustrated by the She Figures data of the European Commission (2013), by the phenomenon known as the 'leaky pipeline' for Germany. While the proportion of doctorates awarded to women in 2013 was still around 45%, this figure fell to well below 30% for the habilitation (advanced postdoctoral qualification), and lies well below 20% for the most highly paid professorships. The loss of women after the doctoral phase is not a German phenomenon: international findings on women leaving academia and international analysis of personal experiences make clear that, in general, the path from graduate school to a tenure-track job is neither homogenous nor seamless. According to the findings of Wolfinger et al. (2006), gender, starting a family and the 'standard career path' (tenure-track in the USA, which is similar to – but not exactly the same as – the path to a professorship in Germany) are closely linked. Overall, it seems to be the case that gender becomes more of an issue the higher the person in question climbs up the academic ladder. Children and marital status, however, no longer play a role in higher positions (Wolfinger et al., 2006; see also Britton, 2010; Costas et al., 2014, 2015; Goulden et al., 2011; Hofbauer and Sauer 2012; Kreissl et al., 2015; Long, 2001; Schubert and Engelage, 2011; van den Brink et al., 2010; Wolfinger et al., 2008; etc.).

In terms of gender, German empirical studies by Lind (2004), Limbach (2007) and Majcher and Zimmer (2008) show the following: if women have a job at a university in the postdoc phase, they are more likely to be found in jobs that are less attractive and prestigious. Moreover, they often

work in lower-status positions and part-time jobs throughout their academic career. Their jobs have shorter-term contracts and are endowed with fewer resources (Lind, 2006: 11). Thus, women are less likely to have assistants, and more often have to do extra work assisting others (Limbach, 2007: 18; Wissenschaftsrat, 2007: 26). Women are found less often in cutting-edge research contexts, and more often in teaching-intensive employment situations. As a result, they have less time to work on their own research and their own career (Majcher and Zimmer, 2008: 699 f.). All in all, it can be assumed that women's productivity is already limited by structural and organizational disadvantages, and that this diminishes their chances of moving up into those positions that are endowed with better resources. In addition to this, appointment procedures for professorships have been found to have a lack of transparency, unclear definitions of qualification and a low level of operationalized selection criteria, all of which is interpreted as being disadvantageous for women academics (Dömling and Schröder, 2011; Lind, 2006: 14; Wissenschaftsrat, 2007: 25). Therefore, this paper focusses on the relevance of 'gender' when looking into the situation of staff working at scientific institutions. At the same time, we would like our results to be understood beyond that. They make clear that the production of knowledge and the formation of scientific careers are not neutral. Gender and social origin, age, family situation and many other factors play a major role and influence the course and formation of scientific careers.

If we look at what relevant research-related organizations such as the Deutsche Forschungsgemeinschaft (German Research Foundation) have to say about equal opportunities, we find the view that, because of the failure to compensate for the above-mentioned disadvantages of women in the academic system, the 'talent potential is not fully utilized' (DFG, 2015). This in turn is thought to lead to less creativity and fewer fruitful exchanges in research and scholarship. This is why, the argument continues, it is necessary to keep a career in academia attractive – particularly for people who are not men – and to design structures with this in mind.

In contrast, however, especially after the postdoc phase, the prevalent view in the German research system seems to be that – in line with the principle of meritocracy (Solga et al., 2009; Team Chance, 2013) – when competing on a precarious career path,[1] the best candidates will win through. Yet numerous research findings have shown that the selection of the survivors is not based on performance parameters, but on other social categorizations and relations of fit – i.e. 'random hazard,' as Max Weber (2002) described the German academic in 1917 – because obtaining a professorship depends on non-academic factors. Today, anyone wishing to pursue an academic career in Germany must expect an extremely long qualification phase. Even after the doctorate, the career path of academics is defined by fixed-term employment contracts, unpredictable career structures and the related uncertainties. Compared to other countries, the proportion of fixed-term contracts in the academic system is particularly high in Germany (Kreckel, 2008). Furthermore, the 'rush hour of life' is intensified in the postdoc phase. It is not possible to predict how long this career phase will last. In the 'rush hour of life', young adults between 30 and 40 years of age, especially women, have to make a number of decisions concerning their professional and private lives, including whether or not to have children (Team Chance, 2013). In general, German academics are operating in a field which places extremely high demands on them, but at the same time offers them virtually no career security. It is, after all, a distinctive feature of careers in the German academic sector that they include long periods in insecure employment situations and competitive conditions. This becomes especially clear in the postdoc phase, as voiced by postdocs from our study: 'it was all a bit more Darwinist' (Group discussion 4).

The qualities seen as basic prerequisites for remaining in the German academic system are not just a willingness to put personal needs on hold, but also a high level of motivation, and, of course, mobility. The German higher education sector is characterized by a special set of problems: even though academic career paths were reformed at the beginning of the new millennium, they are still

embedded in Germany's historical higher education and workforce structures (Keller, 2000). Thus, the lack of career prospects at one university necessitates increased mobility, and a move to at least one other university. Moreover, a deliberate attempt to remain in the higher education sector demands a 'particular inner attitude' which anyone committing to this path needs to have (Beaufaÿs, 2015: 50). One aspect linked to this is that 'mundane' elements of everyday life such as eating, sleeping and social care are treated as secondary to 'extra-mundane' tasks and academic practice, which is seen as higher, more spiritual and more important. In order to gain insight into these individual strategies, we chose a multi-level model for our study, one that we felt would offer a good view of the postdoc phase on several levels.

Our study takes two aspects as starting points: looking on the one hand at the structuring of the postdoc phase, and, on the other hand, at what this means for questions of equal opportunities and gender. We assume, and this is also reflected in our findings, that the structures of the new, more dynamic and competition-oriented system of higher education and research are highly relevant for this matter. We also see our research as a contribution to the as yet unanswered question of what the new 'entrepreneurial university' means for women. Here we are interested not only in structures, in terms of support structures and the funding landscape, but also in the perspective of the postdocs who operate within these structures, positioning themselves, making decisions and developing strategies.

Structural changes in the postdoctoral phase in Germany: key aspects and research questions

Numerous reforms and marketization processes led to changes in recent decades in the German higher education system: first, the Bologna reform has reorganized the formation processes of the various levels of qualification (bachelor's, master's and doctoral degrees). Secondly, the introduction of junior professorships, the Excellence Initiative, new salary structures (W salary) and the introduction of New Public Management have given the academic system a new orientation. Nevertheless, the topic of equal opportunities – with an emphasis on gender – still plays a small role.

The belief in meritocracy – that in academia it is performance alone (Ulmi and Maurer, 2005) that legitimates unequal educational opportunities (Solga, 2005) – stubbornly prevails, despite the fact that the opposite has been proved on many different occasions (e.g. Beaufaÿs, 2003; Dömling and Schröder, 2011; Krais and Beaufaÿs, 2010; Lind, 2006; Majcher and Zimmer, 2008). The underlying idea is that it makes academia more efficient and that a meritocracy means resources can be allocated more fairly (Aulenbacher et al., 2012). Because the university organization functions according to this broadly accepted and recognized maxim, supposedly based on an objective and rational principle of performance (Bielby, 2000: 57), the causes of failure in the academic system are interpreted as the particular individual having not performed well enough (Bielby, 2000: 64).

Two desiderata can be identified within the structuring process: firstly, no comprehensive prospects have been created for the so-called academic employees or staff; secondly, it has so far not been possible to establish any culture of negotiation around good or fair working conditions for this group of people within the staff development or organizational development of the academic organizations. Moreover, promotion in the postdoctoral phase 'only' takes place in programmatic form; it is not embedded in the organizational structures of German academic organizations (Böhringer et al., 2014). This means that, as it stands, the occupational group of so-called postdocs has, on the one hand, gained no new prospects through the reforms in the qualification phases, and on the other has ultimately been 'encroached upon' by the introduction of junior professorships within the reforms to the professor status (Team Chance, 2015). The phase after receiving a

doctorate (postdoc phase) is currently uncertain and precarious. The starting point for the present study is the empirical finding (mentioned above) that there are evidently 'obstacles to promotion' (see Hirschauer, 2004) for women in academic organizations. One argument in this regard is that German women carry a higher burden of caring tasks (Behnke and Meuser, 2003). Support programmes are one of the measures that are supposed to counteract these obstacles to promotion (Böhringer et al., 2014), thereby ensuring more equal opportunities.

By support programmes – in the sense of events or the planned order of such events (written or otherwise) – we mean support services offered to postdocs. This includes fairly general offers of information as well as more precise and structured services, such as coaching or mentoring programmes (Böhringer et al., 2014: 53; Kessl and Krasmann, 2005: 230). Therefore, this paper initially focuses on the funding or support landscape of German science organizations. The research questions are: which programmes are offered; which are used and are there differences in usage patterns between male and female scientists? In a further step, we ask postdocs about their understanding of support, how they experience it and what support has to do with gender equality. We pursue a research approach that not only counts heads, but also asks what issues the postdocs have to deal with, how they judge this phase and how they position themselves in it.

Research design

Against the background of the discourse about (the lack of) equal opportunities in the academic system, and of the specific problems in the German context, we carried out research on the forms and structures of postdoctoral qualification pathways existing in Germany, from the perspective of gender and diversity. Here we were particularly interested in discovering what support structures were actually used by young researchers, and to what extent programmes for training and development, information, networking and mentoring, as well as for financial support, helped to make it less likely that such researchers would leave the academic system during the postdoc phase. But another important question was how the postdocs perceived this support and funding landscape, how they operated in it and how they utilized it. The final stage of the project was to come up with recommendations which could help, in the long term, to optimize the support structures designed to improve equal opportunities at German universities; we have published these elsewhere Team Chance (2015).

The methods were a mixture of quantitative and qualitative research approaches. One component was a representative study of postdoctoral programmes on the homepages of universities and *universities of applied sciences*, as well as non-university research institutes. This was followed by Germany-wide, cross-disciplinary surveys, carried out by means of a standardized online questionnaire, and in the form of group discussions and telephone interviews with postdocs (see Figure 1).

The German postdoc – descriptive results of the online survey

The data basis for the following analyses is our standardized Germany-wide and cross-disciplinary online survey of postdocs.[2] The focus of the survey was the living, working and employment conditions of postdocs in the German system of higher education and research. In addition to this, however, we were also able to give an overview of the group in Germany, something about which little is known so far.

In total, 879 people accessed the questionnaire, and 423 respondents completed it in full. For the subsequent analyses, however, we also accepted questionnaires that contained a small number of
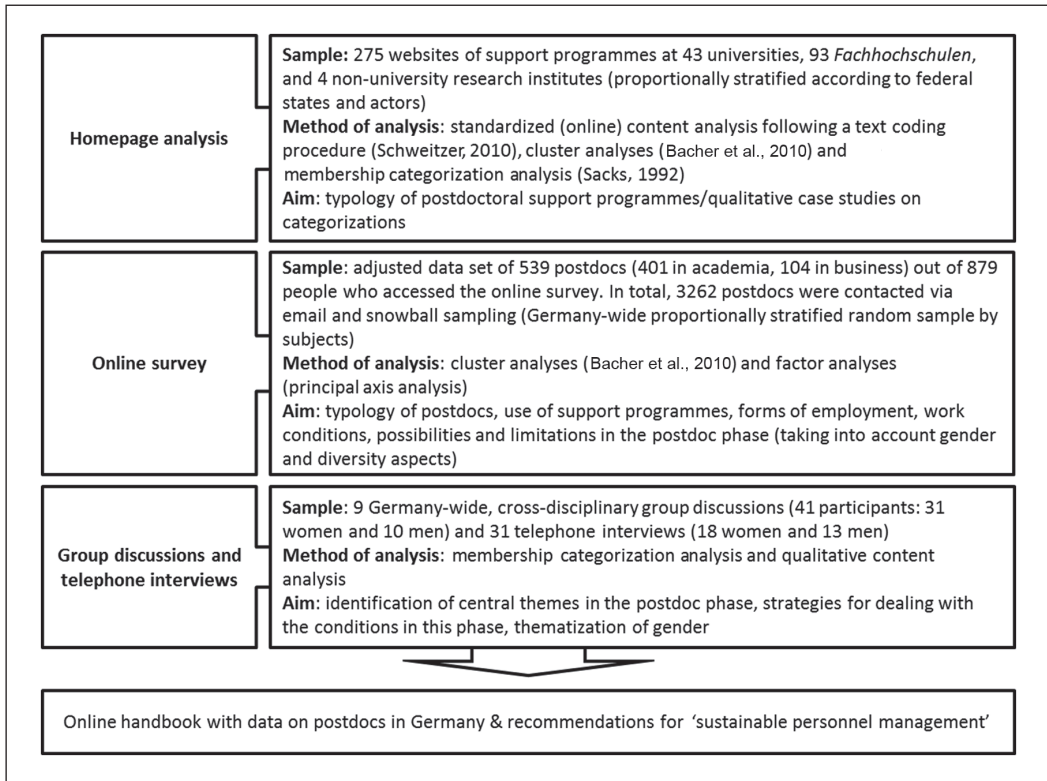
Figure 1. Study design of the project 'Chance: postdocs'.

missing values, or had not been filled in quite to the end, thus allowing a somewhat larger sample. After adjusting the data, we ended up with an analytical data set of 539 cases, in which the number of missing values was still acceptable in statistical terms.

Table 1 shows the socio-structural information given by the postdocs surveyed.

A first glance at the descriptive results of our survey shows that, percentage-wise, more women (59.7%, n=322) than men (38.8%, n=209) took part in the survey (see Table 1). The average age of the postdocs in our sample is 37 years (M=36.7; SD=5.6; min=27; max=63). On average, the postdocs have one child (M=0.6; SD=0.9; min=0, max=5), with a slightly higher proportion of 'childless' postdocs in academia (56.9%, n=228) than in business (51.9%, n=54). With regard to the social origins of the respondents, virtually no differences can be identified. The ratio of respondents with university-educated parents to those who have no parent with a university degree seems relatively balanced (43.2% and 49.7%).

The distribution of the survey participants over the different disciplines shows that nearly 40% identify with the humanities or cultural studies (39.7%, n=214). A further quarter stated that they had completed their doctorate in law, economics or social science (25.2%, n=136) and another quarter in mathematics and the natural sciences (25.8%, n=139). Engineering accounts for around 6% (n=31) of our sample. The categories of medicine and health science (1.7%, n=9) and other disciplines (1.9%, n=10) are the least represented, with just under 2% each.

Table 1. Socio-structural information on the sample.

Variable	Value	Total (%/*n*)
Sex	Women	59.7 (322)
	Men	38.8 (209)
	'I don't want to be categorized'	1.5 (8)
Age	Up to 35	48.4 (261)
	36 to 45	38.0 (205)
	46 and over	8.5 (46)
	Missing	5.0 (27)
	(Age in years)	M=36.7; SD=5.6; min/max=27/63
Children	No children	55.1 (297)
	One or more children	29.1 (157)
	Missing	15.8 (85)
	(Number of children)	M=0.6; SD=0.9; min/max=0/5
Background	Neither parent university-educated	43.2 (178)
	One or both parents university-educated	49.7 (234)
	Missing	23.6 (127)
Subjects	Humanities and cultural studies	39.7 (214)
	Law, economics and social science	25.2 (136)
	Mathematics and (natural) science	25.8 (139)
	Engineering	5.8 (31)
	Medicine and health science	1.7 (9)
	Other subjects	1.9 (10)
Duration	(Postdoc phase in years)	M=3.9; SD=2.7; min/max=0/21
Labour market segment	Academia	79.4 (401)
	Business	14.3 (104)
	'Doesn't apply to me'	6.3 (34)
Total (%/*n*)		100.0 (539)

The descriptive results of our survey also show that the postdocs who responded had an average 'length of stay' in the postdoc phase of around four years (*M*=3.9; *SD*=2.7; min=0; max=21), but that a quarter of these postdocs had been in this 'phase' for far longer than four years.

The sample of 539 is made up of 401 postdocs from academia and 104 doctorate holders from the business world;[3] 34 respondents could not be clearly categorized.

For further comparison, a distinction was made between these two fields of work and the employment situation of postdocs within them (see Table 2). In this respect, the results show that the employment situation for the majority of the postdocs, 75%, takes the form of full-time positions, followed by part-time positions at around 20%. Other types of employment situation make up only a marginal proportion. At the same time, a comparison between the sexes confirms findings from other studies, e.g. Lind (2006), in which it was observed that female academics are more likely to hold part-time positions (23%) than their male colleagues (15%).

A second important aspect of the standardized survey of postdocs was the question of how they perceived and utilized the support structure at their universities and research institutes. For this, the postdocs were asked in the online survey about support programmes that were known to them, used by them, or not offered (at their academic organization) (see Figures 2 and 3).

Table 2. Employment situation by area of work and sex of the postdocs (data in %/*n*).

Employment situation	Academia	Business	Women	Men
Full-time	75.1 (229)	75.9 (63)	67.2 (172)	78.3 (119)
Part-time	21.3 (65)	18.1 (15)	22.7 (58)	15.1 (23)
Marginal employment, 400-euro job, mini-job	–	1.2 (1)	0.4 (1)	0.7 (1)
Occasional/irregular employment	0.3 (1)	2.4 (2)	1.6 (4)	1.3 (2)
Vocational training/apprenticeship	–	–	–	0.7 (1)
Maternity leave, parental leave, other leave	3.0 (9)	–	3.5 (9)	1.3 (2)
Not in paid employment	0.3 (1)	2.4 (2)	4.7 (12)	2.6 (4)
Total (%/*n*)	100.0 (305)	100.0 (83)	100.0 (256)	100.0 (152)
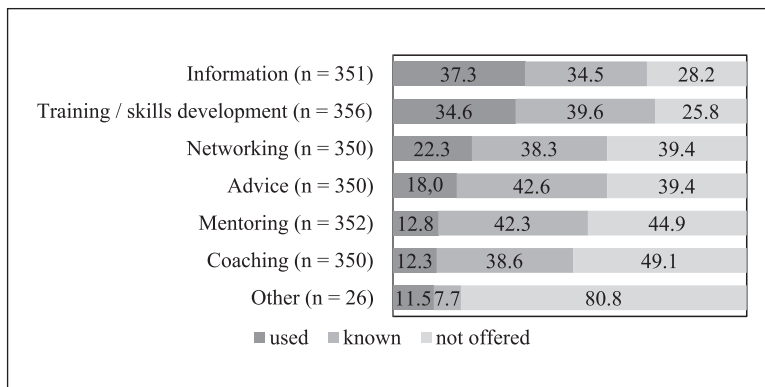
Figure 2. Non-financial support programmes for postdocs (%).
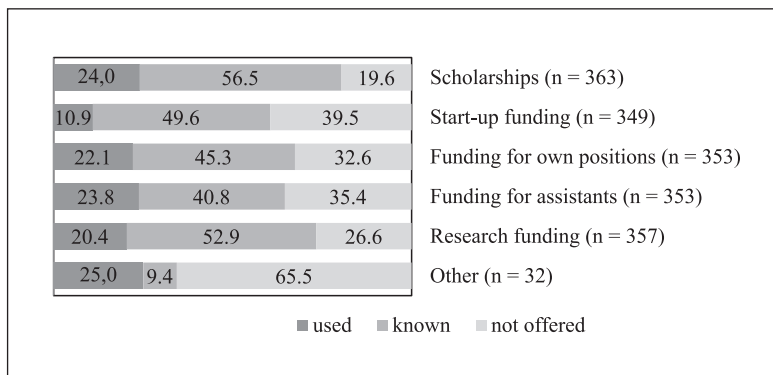
Figure 3. Financial support programmes for postdocs (%).

A first glance at the non-financial programmes (see Figure 2) shows, on the one hand, that a good third of the postdocs in the survey have made use of support measures such as 'information' (37.3%) or 'training and (skills) development' (34.6%). Around one quarter of the doctorate holders (22.3%)

Table 3. Utilization of non-financial support programmes (%/*n*).

Support programmes	Women	Men
Information[+]	41.5 (93)	29.8 (37)
Training/(skills) development	37.8 (87)	28.5 (35)
Networking	24.1 (54)	18.7 (23)
Advice	18.8 (42)	16.3 (20)
Mentoring**	16.3 (37)	5.7 (7)
Coaching[+]	15.1 (34)	7.4 (9)
Other	21.4 (3)	–

Note: Significant differences between the sexes are apparent in the cases identified (***p = 0.001, **p = 0.01, *p = 0.05, +p = 0.10).

Table 4. Utilization of financial support programmes (%/*n*).

Support programmes	Women	Men
Scholarships	25.5 (60)	20.8 (26)
Start-up funding	12.9 (29)	7.4 (9)
Funding for postdoc's own position(s)	22.7 (51)	21.6 (27)
Funding for assistants*	27.9 (63)	16.9 (21)
Research funding	22.4 (51)	17.5 (22)
Other	31.6 (6)	16.7 (2)

Note: Significant differences between the sexes are apparent in the cases identified (***p = 0.001, **p = 0.01, *p = 0.05, +p = 0.10).

have used programmes offering 'networking', while advice services and mentoring or coaching programmes are used much less often. On the other hand, the results also show that certain programmes, particularly those offering direct support, such as 'coaching' (49.1%) and 'mentoring' (44.9%), or 'networking' and 'advice' (39.4%), are not offered at the respondents' academic organizations. Thus, these postdocs do not have the option of utilizing this kind of support.

A similar picture emerges for the financial support programmes (see Figure 3). Here, too, it becomes clear that up to about a quarter of the postdocs surveyed have used the financial support offered, e.g. 'scholarships' (24.0%), 'start-up funding' (*Anschubfinanzierung*) (10.9%), 'funding for positions' (22.1%) or 'research funding' (20.4%). A large percentage of the respondents, however, stated for nearly all the categories that this type of financial support was not available at their academic organization.

We were also able to find indications of gender-specific use of support programmes. Table 3 presents the use of non-financial support programmes, comparing men and women. It becomes clear that in percentage terms, more female postdocs are making use of the services offered in the German support and funding landscape. The only significant difference, however, is in the use of mentoring programmes (*Chi²* (2, *n*=352) =9.09; *p*=.01; *Cramer's V*=.16). This significant difference can be explained by the fact that mentoring programmes in Germany are usually a support measure targeted specifically at women (Böhringer et al., 2014). But information services and coaching programmes are also used more (almost significantly more) by women.

When it comes to the utilization of financial support programmes (see Table 4), however, it can be observed that the percentage differences between women and men are less marked, and that the only significant difference that can be identified between men and women is in the funding of positions for assistants (*Chi²* (2, *n*=353) =6.23; *p*=.05; *Cramer's V*=.13).

It can be observed, then, that women seem to use the support and funding landscape differently to men. Overall, the percentages of female early-career researchers using support/funding programmes are higher than among their male colleagues. However, the men make greater use of financial support programmes than non-financial ones.

According to these findings, this is not simply a matter of a support or funding landscape that is 'specifically aimed at women', as shown by the mentoring services; instead what we see here is a 'gendered' usage of the German support landscape. This finding may certainly be viewed in a critical light. It is not particularly surprising that those support measures especially designed for women, such as mentoring (Böhringer et al., 2014), are in fact used by women. At the same time, one might ask whether it makes sense to maintain a special support pathway for women which is largely based on the voluntary work of female mentors, and is usually underfunded, as well as working on an assumption of deficits (women do not have adequate networks in the academic world). A further factor is that these programmes, contrary to public perception, are only actually available to a limited extent (Böhringer et al., 2014), but have a considerable symbolic impact. This may be a deliberate strategy of funding policy, but it means that all women have to be prepared to justify this 'preferential treatment'.

Postdocs' understanding of support

In the group discussions, the postdocs had the opportunity to formulate their own understanding of support. Asked whether they received support in their everyday lives, most were able to answer 'yes'. As the group discussions continued, different forms of support came to light. Support provided by and at their particular academic organization in the sense described above is only one part of what the postdocs see as support.

Structural support offered by programmes at the individual institution

With this form of support, the postdocs focused on services available at their particular institution which they were able to access or utilize. These include, for example, forms of financial support for student assistants, or perhaps coaching or language courses. It is striking that these types of support are rated much more highly than reciprocal forms of support by colleagues and networks. Are they useful or not, and how much effort is required in order to access them? There are, firstly, programmes that can be quite superfluous (e.g. prizes for dissertations), because they may bring honour and public visibility, but do not give access to any (career) prospects and are underfunded. Programmes are also viewed critically if the administrative effort required is high, and the amount of funding that can be obtained is low. Financial assistance for conference attendance, on the other hand, is regarded as absolutely necessary by all the respondents, but is not guaranteed everywhere by adequate departmental or institutional funding. It is striking that there are specific programmes, most notably coaching and mentoring, which are missed if they are not available. It is mainly women who make this observation, or who universally rate them – if they are available – as positive, because they help to make the academic 'rules of the game' more transparent, or open up career options. At the same time, however, the postdocs realize that such programmes cannot remedy the structural problem – i.e. that there are too few permanent positions – and may actually exacerbate the problem, because they encourage people to stay in academia for longer. In the following extract Carolin and Mareike refer to a dilemma inherent in fostering postdocs. Support and fostering keeps more researchers in the academic system and therefore ensures that there are always enough candidates in the competition for a professorship. This might be good for the meritocratic system, but for those who are in the competition-based system it means that there are more and more ('five more') competitors.

| CAROLIN: | […] Or if you support postdocs, you foster young researchers on that level, which on the one hand is good for competition, and for the, well, [making sure] that really only the best are selected so to speak, to get professorships, so, on a macro-level, in terms of society, that may be good. [Laughing] I personally think to myself: Okay. But that does mean |
| MAREIKE: | five more. (Group discussion 1) |

It also becomes clear that there are gaps which are poorly covered or difficult to cover with support programmes. In the area of mobility, for example, it is precisely the internationally mobile postdocs who observe that frequent relocations present major logistical, financial and social challenges, which the universities concerned do not provide sufficient help with – in the form of support programmes or financial assistance.

Support based on collegiality and networking

Firstly, a distinction is made between collegial support given in the everyday work context, and that which is available in inter-institutional networks. Here it is seen as important and helpful to be able to exchange information about practical questions of everyday work (for example in teaching), or about implicit skills required in academia (e.g. writing applications). But participants also mention the opportunity to talk with others in relation to 'mental health', especially in the light of the precarious working conditions for the *Mittelbau* (non-professorial academic staff). Collegial forms of support are rated as extremely valuable, necessary and helpful. In general, the question of competition (for the few permanent positions) tends to be played down, and associated with the phase of actually applying for professorships. Collegial communication and networking are very much based on personal initiative, and on the willingness to get involved oneself (reciprocity). This form of support, which is universally seen as positive and necessary, is only backed by institutionalized forms of support – if at all – when it comes to establishing formal networks.

Support from family, partners and friends

Support from friends, acquaintances, partners, parents and family is mentioned by all the postdocs, but the particular importance of this kind of support is mainly emphasized by those who have children. In these cases, it is regarded as absolutely essential. It fills in the gaps in other professional support services, but it also requires maintenance, and is based on reciprocity. The following extract from group discussion 1 makes clear that there are subtle differences within the private support system. The partner may be seen as someone who 'keeps the kids busy' without expecting anything in return, just because he/she is the partner. However, friendship ties need to be maintained; they are grounded in the reciprocity of help.

| SABINE: | In my case it's just not possible without help and support. Well, even if it fell through again today, but if you want to do this as a mother, you need people around you who take the children off your hands once in a while. And whether it's your partner, and I'm really glad that I have one who actually does that, who's going to somehow keep the kids busy again in the weekend, so I can write a bit more, or a social circle, and I always find that difficult, because you have to invest time so that it works, you know? You can't say: 'Here are my kids, and I won't do anything for you', or something like that, you have to invest in those friendships too, so that the children get taken off your hands once in a while. (Group discussion 1) |

Private support can take different forms: it can, for example, consist of financial assistance, or of conversations with one's partner which help to relieve stress. Chatting about the experiences of

others is also mentioned here. Support from family and friends can turn negative, however, if it leads to (financial) dependency, and is detrimental to one's own autonomy.

Support from individuals

Not only institutionally based programmes, but also – primarily – individuals in the work environment are cited as (potential) sources of support. Here a distinction is made between two groups: line managers and mentors. Mentors, in particular, are only cited as sources of support by women; men do not mention this kind of support relationship. This, then, is further evidence of the above-mentioned phenomenon of a female support model. The support relationship with line managers is described as complex, and covers the following areas: provision of departmental funds for conference attendance; feedback on articles; discussion of career prospects and introduction to the nature of work in the academic world. The relationships with their line managers which the postdocs describe cover the whole spectrum. In particular, impending parenthood is an important transition point in their professional biography, in which line managers can prove to be supportive or obstructive. Managers are seen as supportive if they devise suitable arrangements for working hours, and look for and find follow-on funding. Conversely, of course, it is obstructive and unlawful if managers refuse to extend contracts because of pregnancy, or present pregnant postdocs with cancellation agreements. Overall, the line managers seen as supportive are those who allow professional and geographical continuity (by means of third-party funded projects) despite fixed-term positions.

Lack of support: work–life interferences in scientific careers

As well as an appreciation for support and support programmes, the statements of the postdocs also show that there is a fundamental gap which is not addressed by programmes or individual support: the organization of everyday life ('alltägliche Lebensführung', Voß and Weihrich, 2001) is a central problem in the postdoc phase (as well as in other phases). In this period, life constructs become more complicated due to parenthood, or in some cases couple relationships. As we know from dual-career research (Behnke and Meuser, 2003), it is usually women who have to bear the main burden of organizing everyday life. In the group discussions presented here, no couples were questioned, but statements from the female halves of dual-career couples make it clear that there is a broad area of life that is not addressed (and cannot be addressed) by formal support. In their work on the organization of everyday life, Voß and Weihrich (2001) point out that the 'relationship between all a person's activities in the different social spheres relevant for that person […]: paid employment, family and housework, leisure and recreation, educational activities' (Voß and Weihrich, 2001: 10) requires its own kind of construction work. The result, the organization of everyday life, is a 'construction that each person has to make for himself/herself' (Voß and Weihrich, 2001: 11).

The statements of the postdoc respondents illustrate this very well, especially when it comes to the coordination of career and family: the two can be combined, and can be aligned in time and space, as described in the following statement by a female postdoc. Her partner is also an academic in the same discipline, and they have a daughter together, who is not yet of school age:

> NINA: And my daughter was at her first conference when she was three weeks old, and she just always comes with us. But that's just what I have to do, and all the costs and so on, you just always cover them privately. And for the child, she's still very, very small now, but of course, as soon as she goes to school […]. (Group discussion 4)

Her statement hints that the usual arrangement is 'threatened', because in future the daughter's compulsory school attendance will mean that she has her own spatial structures, which will need to be taken into account when organizing their lives.

The problem of reconciling career and family is well known, but – as the following extract indicates – this constitutes work, and the organization of everyday life is a constant feat of construction:

> MAREIKE: […] I think, when you always have to organize everything yourself, organize your whole day-to-day working life and your whole day-to-day family life, then sometimes I think it would be nice if you could just sit down somewhere, and someone would support you, [laughs] without you having to organize it yourself. (Group discussion 1)

This work takes quite specific and sometimes unpleasant forms, as Nina describes with regard to her daughter's conference attendance:

> NINA: […] so now in two weeks/ in three weeks I'll be travelling to the USA for seven weeks, I still haven't told the nursery, because they're going to look at me, the child's being taken out again and [laughing] put back in again, I'm really scared, [laughing] that I'll look like a bad mother. (Group discussion 4)

Conversations must be had, the child's absences must be explained and arranged, and, above all, the daughter's re-entry into the nursery has to be ensured. Among the discussion participants, it is mainly the women who present 'the caring about care'[4] and the organization of everyday life as *their* work.

Voß and Weihrich (2001) point out that the organization of everyday life develops in a certain inner logic, and a certain unquestioned self-momentum, which makes things easier for the actors in their everyday life. This only partially applies to the postdocs questioned. In their self-representation, the women in particular are constantly adapting the organization of their everyday life to the inner logic of the academic system. They relocate, for example, if this is necessary for further career prospects. Thus, the organization of everyday life is something that is constantly being re-examined; this also applies to postdocs who do not yet have children. The topic of 'moving' is one that demands an especially large amount of time and energy:

> MARIA: There was no financial assistance when I moved to '[town Neustadt. Lots of other help, but it wasn't that much use. I had help from the Welcome Centre, to find a place to live, a meeting with a student assistant once a week. But that isn't enough, you have to look every day, not (laughing) every week, and it took six months before I found permanent accommodation, and until then I moved six times, from one sublet to another sublet, and in those six months I could hardly get anything done on my work. (Group discussion 4)

Maria describes her experiences after her move to '[town Neustadt'. The work–life interference seems to have been very strong at this point in her career. She had to manage two parallel tasks: working and finding accommodation. Though she had help from the university – a student assistant – while looking for accommodation, it was nearly impossible to manage this while working. Neither her work nor her search was very productive at this time. Her experiences draw attention to the fact that sometimes it is not possible to organize everyday life effectively while working, especially if people are alone. Moving seems to be a critical point in this regard. It is barely possible for an 'established lifestyle' to develop under these conditions (Voß and Weihrich, 2001: 11); any arrangements that do emerge become long-term makeshift solutions. Overall, the respondents

focus more on the frictions of everyday life, not so much on the broader perspective of the division of labour between the sexes, with the question of its relevance for career options. The organization of everyday life is not an area addressed by support programmes, and is left to the inner life of social (couple) relationships. The respondents do not evoke this as a deficit; instead, the women in particular see the reconciliation of different areas of life as their task. This becomes particularly clear when they fantasize about being relieved of the burden of organizing everyday life, as in the following longer extract from a group discussion:' in the quoted material and 'Maria describes her experiences after her move to a new institution' in the text.]

DOREN:	Well I'd often talked with colleagues, male and female, and what we've always ended up with at some point is that what you actually need, in order to pull off an academic career fairly safely, what you'd ACTUALLY need, is a wife.
MARIA:	[Laughs] Yes.
DOREN:	Yes, and in this absolutely classic sense.
SANDRA:	Classic.
LINDA:	Exactly.
DOREN:	And the system is really based on you not having to do the things that a classic wife does.
LINDA:	Exactly.
DOREN:	So if you wanted to do this career as a woman, you'd actually need a wife.
MARIA:	Yes.
[Laughter]	
DOREN:	And or, well I know, in your case of course, if you're both doing it, you have to work it out some other way, don't you?
LINDA:	No, but we do actually we have made jokes–
DOREN:	That you [unintelligible, simultaneous talking].
LINDA:	It's not politically correct, but we should look for a wife [unintelligible, simultaneous talking].
[Laughter] (Group discussion 4).	

Here the postdocs express very clearly what is needed in order to further an academic career: someone who takes over the work of organizing everyday life. This is discussed jokingly here, but with a serious background – they do not see this as an option for themselves, otherwise it would not be a joke – what they are referring to here is a wife 'in the classic sense'. This extract indicates that the postdocs see the competitive advantage which a gendered division of labour within personal couple relationships can give.

Self-positioning strategies of postdocs in a precarious academic system

On the one hand, it becomes apparent in our interviews that the concept of 'scholarship as a way of life' is a significant theme for the postdocs. There is also, however, another side to this – a movement away from this concept, and towards a life in academia which is not dedicated solely to the profession, but demands space for everyday things and duties – outside of academia. But how do postdocs deal with the fact that one has to show a high level of commitment and achievement, despite extremely slim chances of a long-term academic career? Despite their passion for scholarship, and their knowledge of the high standards they must meet, the participants in the group discussion (men and women) were able to assess their chances quite realistically, and could see the disparity between the number of potential applicants and that of advertised professorships. They regarded both their options for leaving academia and their chances of promotion within the academic organization – i.e. appointment to a permanent professorship – as problematic.

CAROLIN: Exactly. [laughing] Support [unintelligible] [laughs]. Here, it was all a bit more Darwinist, [laughing] whoever dominates wins the race? But it's… Well, the problem is actually, when you as a postdoc turn 40 at some point and don't get a professorship, then you really have the worst possible deal, I think, from an economic point of view. Because you can't continue to be employed, the positions in academia or in management that can be made permanent are really rare. (Group discussion 4)

This quote from a female postdoc makes the situation of postdocs in Germany especially clear. The phase is defined by a structurally ambivalent position 'between career prospects and tendencies to drop out (*Abbruchtendenzen*)' (Grühn et al., 2009).

The result of this ambivalent position, which has been described as a 'biographical balancing act' ('biographische Spreizung', Dörre and Neis, 2008: 139), is also revealed in the subjective processing of the postdocs questioned. The work situation of many (most) postdocs in Germany meets virtually all the objective criteria for precarity; hence, early-career academics often limit their planning perspective to the current status passage (Baader and Korff, 2015; Krawietz et al., 2013: 671). Among other things, they set themselves time limits – 'deadlines' – as the following extract shows:

CORINNA: […] And I also set myself a deadline, and said: if, within two years, I haven't found some sort of job, or I don't feel as though I'm getting anywhere, then I have to find a new direction. Because it's just not possible. You can't just slog away all the time, and not get anywhere. (Group discussion 6)

According to this extract, the planning perspective of this participant in a group discussion covers the next two years. She wants to use this time, which she has set herself as a 'deadline', to climb up the next step on the higher education career ladder. It also becomes clear, however, that this postdoc is considering the idea of a change in vocational direction, and will if necessary leave academia if, despite 'slogging away', she cannot survive 'random hazard'. However, the negative factors of the work situation are partially cushioned by a slim hope of better prospects after crossing the next threshold, by interpreting the situation as a necessary developmental phase, and above all, by passion for and enjoyment of academic work:

ELLEN: Yes. Somehow recently I've been thinking a lot about just giving it up, simply from sheer exhaustion, and then I've always thought, well, what else could I do? And I've always realized that I actually like doing it. I love teaching, I like writing texts, I like lecturing too, when I have the leisure and the time to do a reasonably good job of it. I really enjoy the job. And these surrounding circumstances REALLY get me down. [Laughs] I can't put it any other way. And that's a problem. And if the Mittelbau [sub-professorial level of academic staff] were still there, I don't need the 'professor' sign on my front door. In terms of status, I don't care about that. (Group discussion 5)

It becomes clear here that Ellen feels an enthusiasm for academic work, but that it is the circumstances that 'get her down' (German: 'machen mich fertig'). What is being evoked here is the fact that the personnel and employment structures in the German academic system preclude any security within the system, given that permanent academic employment in the German higher education system is almost exclusively linked with the holding of a chair (Dörre and Neis, 2008: 128). Besides this, the numerical ratio of the sub-professorial level of academic staff (*wissenschaftliche Mitarbeiter_innen*) to professors is extremely unfavourable, especially in contrast to other industrialized countries (Kreckel, 2011). There is also the question of whether the postdocs actually

want this, as the extract from the group discussion shows. Ellen, at least, states that she does not need a '"professor" sign on [her] front door'; she would prefer a position in the *Mittelbau* (i.e. as a non-professorial academic).

Postdocs find themselves in the 'rush hour of life'. The 'higher education' career path, however, is difficult to reconcile with transitions in other areas of life, given that the stabilization of their professional role, and perhaps their advancement up further steps on the career ladder, often fall into the same stage of life as starting a family. Career conditions in higher education are very difficult to reconcile with parenthood. Studies show that young academics in Germany show a level of childlessness that is presented as dramatic – especially in comparison to other population groups with academic qualifications. Cases of 'belated' parenthood lower the rate of childlessness, but considerably more than half of all women over 42 working in higher education are childless, as are half of all men in this age group (Krawietz et al., 2013: 672). Yet this situation, which applies generally to all career phases in higher education, seems to be particularly pronounced and intense in the postdoctoral phase:

> ELLEN: And I believe that age also plays a role, because of course so many […] DICHTHEITSPHÄNOMENE [phenomena of intensification/compression] come together in this phase. Yeah well so then really the um 'honeymoon is over', but then (laughs) there's the question, children or not, […] maybe some people already have parents who need care. So, there's simply a completely different pressure, in the worst case a completely different family pressure, and all at the same time, when you're really in a phase, where a six-year rule, a second one comes again, and then there's time pressure again too. And I think that for many people […] that causes, more or less explicitly and strongly, that feeling of being in a race […] and also that feeling of no longer really being free to decide what you're doing. […] I can imagine that that's a problem that many people have. […] And strangely enough I also feel as though I'm in a race, [laughing] although I don't have children or parents in need of care. But this […] it's like another clock that's ticking. It may not be so much the biological clock for women who absolutely want to have kids straight away, but it is nonetheless a sort of clock ticking away and where you think: 'Okay, and once it's run out, then I'm in my mid-forties, and if it hasn't worked out by then, what do I actually do then?' (Group discussion 5)

We can read these statements as clues to why women leave the system of higher education and research in greater numbers in the postdoc phase, even if they actually enjoy the job and see it as fulfilling their talents. When we look at the exodus of female academics, it becomes clear that the employment conditions at German universities are one of the reasons why women leave the academic career path, despite having sufficient potential to stay – women who are unwilling to submit to the demand for absolute dedication to scholarship (Jung, 2011; Metz-Göckel et al., 2010: 8). This would suggest, though, that issues around starting a family or reconciling academia and family are not the only reasons why more women not only think about leaving, but actually do leave the academic system in the postdoc phase, even though they now constitute a high proportion of those completing doctorates.

Summary and conclusion

Equal opportunities between women and men is not a core issue in the promotion of postdoctoral researchers in Germany. Instead, it tends to be addressed indirectly via a colourful array of compensatory programmes. By compensating for (female) obstacles, support programmes are supposed to ensure equal opportunities, and therefore equal outcomes, for career paths, thereby facilitating 'initial equal opportunities' en route to a professorship. They are supposed to remove

obstacles to promotion based on, for example, resources (money, time, etc.). The principle is supported at the level of education policy by the prevailing perception of equal opportunities as equality of opportunities in competition and promotion. Ideally, resources are allocated according to individual performance (e.g. Flitner, 1985; Hopf, 2010; Jansen, 1994).

In relation to the question of 'equal opportunities and gender at German universities' in the postdoc phase, the following results of our study are relevant. One key finding was that certain support programmes, such as 'coaching', 'networking' or 'mentoring', are not offered everywhere; this is also true of financial support programmes. Many postdocs therefore do not have the opportunity to utilize this kind of support. Furthermore, we found evidence of a gender-specific demand for support programmes. It becomes clear that, in percentage terms, more female postdocs are making use of the services offered in the German support and funding landscape. The only significant differences, however, are in the use of mentoring programmes. These significant differences can be explained by the fact that mentoring programmes in Germany are usually a support measure targeted specifically at women (Böhringer et al., 2014). However, information services and coaching programmes are also used more (in fact, significantly more) by women. This finding may certainly be viewed in a critical light. It is not particularly surprising that those support measures especially designed for women, such as mentoring (Böhringer et al., 2014), are in fact used by women. At the same time, one might ask whether it makes sense to maintain a special support pathway for women which is largely based on the voluntary work of female mentors, and is usually underfunded – as well as working on an assumption of deficits (women do not have adequate networks in the academic world). A further factor is that these programmes, contrary to public perception, are only actually available to a limited extent (Böhringer et al., 2014). These findings in the standardized part of our study on patterns of usage among postdocs should be given critical consideration in the context of the qualitative results from the group discussions: the participants are missing aspects of everyday lives in formal programmes. It is therefore possible to say that support programmes possibly do represent a plus for career advancement, but at the same time participation in these programmes is generally in turn associated with additional work and time consumption. Financial support, in particular, generally involves a laborious application process (the outcome of which is not guaranteed), and participation in a mentoring programme means women have to make time for it. In this respect, we can justifiably ask whether support programmes without inherent career prospects actually create additional work that has to be integrated into everyday life. Once again, we come back to the (unspoken) demand in academia that individuals demonstrate a 'particular inner attitude' in committing to this path (Beaufaÿs, 2015: 50). One aspect of this is that 'mundane' elements of everyday life are treated as secondary to 'higher' academic tasks and academic social practice.

The theme of equal opportunities is hardly mentioned in this phase, although it is highly significant for the exodus of women from the academic system, as we know from the 'leaky pipeline' phenomenon. The absence of a discourse on equal opportunities distinguishes the discourse on the postdoc phase from the official discourse in education and research policy about the structured doctorate, which was linked with hopes that transparent structures would provide better support for women. The postdoc phase has, overall, very little structural underpinning; instead, it seems to be left to 'random hazard' or 'random self-organization' or 'self-selection'. In the restructuring of the higher education and research system over the last few years, this phase has been 'covered up', and not endowed with prospects (Team Chance, 2013). So far there are only very gradual signs of a rethink about this. Programmes for supporting postdocs do exist, but these are utilized differently by men and women. The insight that the use of these programmes is 'gendered' is a further relevant finding of our study. It suggests that aspects of the 'gendered university' (Acker, 1990) are taking effect here too. Even beyond different forms of use of support programmes, the postdocs are not a

homogeneous group, as our study shows, for example with regard to the length of their stay in the postdoc phase. However, research policy in Germany addresses them as if they were homogeneous. The heterogeneity of this group needs to be taken into account in current reflections on the reform of this phase.

Nor do the existing support programmes seem to take into account the heterogeneity of this group. Overall, our study offers indications of why more women leave the academic system, or think about leaving it, in this phase. This has much to do with the structures of the academic system, and not with the women's qualifications and skills. An increased exodus cannot be explained solely by the problem of reconciling family and work, but is also linked with the construction of 'scholarship as a way of life' demanding a 'particular inner attitude' (Beaufaÿs, 2015: 50) on the part of the organization, with precarious fixed-term contracts that extend into the middle of life, and with increased pressure in a more competitively organized academic system. Exhaustion, 'intensification', 'pressure', 'time pressure' and an ongoing 'feeling of being in a race', as described by researchers in the postdoctoral phase, do not seem to be helping to make 'academia as a career' attractive for women, especially not if they see men more successfully negotiating the only remaining career path at German universities: the path to a professorship. If academia as a workplace is to be attractive for women, then we need to develop a 'gender-fair higher education and academic culture', addressing the diverse facets of gender inequality in current practice.

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Notes

1. 'Precarious' means that very often academic careers in Germany include a chain of short-term contracts and entail an uncertain future.
2. Postdocs who have completed the doctoral process with their oral exam (viva, disputation, colloquium, etc.), and who are or have been working in academia, business, the non-profit sector or another non-university area. Here we also define postdocs as academic staff (including junior and fixed-term professorships) and experienced researchers with up to 10 years of teaching and research experience after their doctorate. They may or may not have their habilitation, and may have fixed-term or permanent contracts. Time taken for care work, illness and other work experience is also included here.
3. The category 'business' includes all respondents who are not at a university, *Fachhochschule*, other higher education institution or external research institute. The label 'business' was mainly chosen for emphasis, and for the sake of simplicity.
4. It is not possible to fully discuss the concept of care here, but see, for example, Daly and Lewis (2000).

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Dual career couples in academia, international mobility and dual career services in Europe

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Abstract
The number of dual career couples in academia is growing due to the increasing proportion of women with a doctoral degree and the greater propensity of women to choose another academic as their partner. At the same time, international mobility is required for career advancement in academia, creating challenges for dual career couples where both partners pursue careers. This paper has two objectives: (a) to raise the increasingly important issue of dual career couples in academia and the gendered effect that the pressure for mobility has on career advancement and work–life interference; and (b) to present examples of recently established dual career services of higher education institutions in Germany, Denmark and Switzerland, responding to the needs of the growing population of dual career couples. Due to long established practices of dual career services in the USA, the European examples will be compared with US practices. This paper raises the significance of considering dual career couples in institutional policies that aim for an internationally excellent and diversified academic workforce. It will appraise dual career services according to whether they reinforce or address gender inequalities and provide recommendations to higher education institutions interested in developing services and programmes for dual career couples.

Keywords
Dual career couples, academia, mobility, dual career services, gender equality, international staff

Introduction

This paper emphasises the importance of dual career couples in academia in the context of an increasing population of women PhD graduates and presents institutional examples in European and US higher education institutions (HEIs) responding to the dual career couple phenomenon. Furthermore, it highlights the gendered effects that international mobility can have for a dual career couple in

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academia and attempts to review recently established dual career services in European HEIs according to whether they reinforce or address gender inequalities in the academic workplace.

More women PhD graduates than men are in dual career relationships in academia. This situation is partly created by the growing proportion of women with doctoral degrees (Ginther and Kahn, 2009; SHE, 2015; Stephan and Kassis, 1997) and the greater tendency of women academics – compared to men – being partnered with other academics (Ackers, 2005; Schiebinger et al., 2008). At the same time, researchers are required to be mobile to advance their careers, especially in the sciences (Ackers, 2005; Mahroum, 2000; Morano-Foadi, 2005). Finding two quite niche academic jobs in close proximity becomes even more challenging for two researchers in a relationship.

At a systemic level, mobility is a key concept of the European Research Area (ERA), with the following potential benefits: enhancing excellence in scientific performance; knowledge and technology transfer; and improving economic and social welfare (Zubieta and Guy, 2010). The promotion of mobility of academic staff in Europe is reflected in the plethora of European support programmes that have been available to academic staff and researchers since the 1960s (Teichler, 2015). While the significance of mobility for individuals' career advancement and wider scientific, economic and social benefits is highlighted, there is less emphasis on how the requirement for mobility in academia can have differential outcomes for men and women in terms of career progression and work–life balance, especially in the context of being in a dual career couple.

Dual career couples in academia in the USA and Europe have been increasingly considered for talent management and gender equality institutional policies (especially in relation to work–life balance, diversity at the workplace) (Ackers, 2004, European Commission, 2005, 2010; Schiebinger et al., 2008).

In the USA, dual career initiatives date back to the 1980s and there are currently well-established dual career policies and programmes across a great number of US institutions. These practices have been mainly framed around the rationale of academic talent management, as highlighted in a recent US study:

> *Meeting the needs and expectations of dual-career academic couples while still ensuring the high quality of university faculty is the next great challenge facing universities. (Schiebinger et al., 2008: 1)*

In Europe, recruitment and retention of excellent academic staff is also recognised as the most challenging issue for higher education (Huisman et al., 2002; Van den Brink et al., 2013). However, scholars have focused on the significance of pay and academic freedom (Huisman et al., 2002; Verhaegen, 2005) to explain academic recruitment and retention. The effect of partner opportunities on dual career couples in European academia is either not mentioned or seems to be of limited importance. Only a handful of studies raise this issue in the European context (see Ackers, 2004; Rusconi and Solga, 2007; Vinkenburg et al., 2014) with even less research focusing on how European institutions respond to this issue (Zingg, 2013). Interestingly, research on dual career couples in Europe has been discussed with a greater gender dimension compared to the USA, potentially reflecting the recent preoccupation of scholars and policy makers with gender inequality. For example, dual careers are mentioned in a European report on gender mainstreaming in research recommended employers to

> *...ensure that researcher mobility measures incorporate the gender dimension (e.g. taking into account dual careers, work-life balance issues). (European Commission, 2012: 43).*

In Europe, the number of women at doctoral level has been growing faster than the number of men since 2002 and women are relatively well represented at the lower grades of the academic career

ladder (European Commission, 2015). However, their numbers are continuously dropping in more senior posts with quite a small proportion being found at top positions in higher education. On average, only 20% of top positions in European HEIs are held by women (European Commission, 2015). In terms of participation in decision-making bodies, the unbalanced representation of women persists, both in scientific and management boards of universities and acting as heads of HEIs across Europe (European Commission, 2015).

Scholars argue that the persistence of gender inequality is explained by various factors: individual issues such as choices and preferences, or family–work conflict (Ginther and Kahn, 2009; Mason et al., 2013); and structural reasons, such as gender schemas and biases (Moss-Racusin et al., 2012; Steinpreis et al., 1999; Valian, 1999) and demographic inertia (Kullis et al., 2002).

This paper endorses the assumption that HEIs are gendered organisations (Acker, 1990, 2008) with gendered norms, everyday practices and policies, which reinforce and reproduce gender inequality in the academic sector (Bailyn, 2003; Deem, 2003; Knight and Richards, 2003; Van den Brink, 2011).

This paper examines the potential effects of the increasing requirement for mobility in the context of a dual career couple and the emergence of dual career services in Europe (rationale, what services and for whom). It will do this through presenting the growing population of dual career couples and reviewing the recently established services that HEIs in Denmark, Germany and Switzerland have developed – compared to the well-established US programmes – to meet the needs of this population. While it raises the significance of considering dual career couples in institutional policies that aim for an internationally excellent and diversified academic workforce, this study also explores to what extent dual career services address or reinforce gender inequalities. This is undertaken in the following sections.

A growing population of dual career couples in academia

The term *dual career couple* was first coined in the context of 'dual career families' by Rapoport and Rapoport (1969: 3), which reflected

> ...*families in which both husband and wife pursue careers (i.e. jobs which are highly salient personally, have a developmental sequence and require a high degree of commitment) and at the same time establish a family life with at least one child.*

Therefore, individuals in dual career couples seek careers that require commitment and are characterised by career advancement. This study focused on dual career couples where at least one is working in academia (referred to as *dual career couples*) and includes dual career couples where both are academics (which will be referred to as *dual academic career couples*).

Marriage among academics is a common phenomenon. Various recent studies in the USA and Europe have shown that about a third of all faculty members have an academic partner (Dubach and Stutz, 2013; Schiebinger et al., 2008). European studies focused on recipients of prestigious funding schemes provided similar findings, with a recent report on European Research Council grantees reporting a high incidence of dual career couples, especially in science (Ackers, 2000; Vinkenburg et al., 2014).

In the academic world, the importance of dual academic career couples – or the *two body* problem as it has been known in the scientific community (Wolf-Wendel et al., 2003) – has been exacerbated by the increasing number of female PhD graduates and the tendency of women in academia to be partnered with another academic, as reflected in studies in the European Union (EU) and US (Ackers, 2004; Dubach and Stutz, 2013; Schiebinger et al., 2008). For example, in the USA, 40% of women – compared to 34% of men – were partnered with academics. In Switzerland, a study of

Swiss academic staff[1] showed that 45% of all female respondents and 32% of male respondents live in a dual academic career couple.[2] This gender difference was reflected at all levels and increased at senior academic levels, with 57% of female professors reporting that they lived in dual academic career relationships.

At the same time, *disciplinary endogamy*[3] seems to take place especially in natural sciences, with high proportions of women being married to scientists (Gibbons, 1992; Schiebinger et al., 2008). For example, 83% of women scientists in academic couples were married to another scientist compared to 54% of male scientists (Schiebinger et al., 2008). According to the American Institute of Physics, 44% and 69% of married female physicists were married to physicists and other scientists, respectively[4] (Gibbons, 1992). In other fields, 80% of female mathematicians and 33% of female chemists were married to scientists or engineers (Gibbons, 1992). In Germany, a study by the German Physics Association showed that 86% of female physicists were in a dual academic career couple with another physicist and 'the number is expected to be as high in other disciplines' (Ruschikowski, 2003). While these studies might not represent the full population of academic staff in Europe and the USA, they are still indicative of the fact that a substantial proportion of academics are partnered with other academics globally.

International mobility for dual career couples: A gendered practice?

Pursuing an academic career increasingly requires international mobility (Mahroum, 2000; Morano-Foadi, 2006), undertaking a number of short-term and uncertain employment contracts at the early career stage with relatively low salary and lack of support during mobility stages (Ackers, 2004).

For dual academic career couples, there are additional challenges: a highly competitive labour market and 'locationally constrained careers' (Green, 1997) due to the highly specialised nature of the work and the limited availability of vacancies. Therefore, the primary concern for dual academic career couples seems to be finding two highly skilled – and rather niche – jobs at the same place or in close proximity (McNeil and Sher, 1999; Wolf-Wendel et al., 2003). Individuals in dual career couples did not accept a position if their partner was not hired as well (Rusconi and Solga, 2007[5]; Schiebinger et al., 2008[6]). While this could affect both partners equally, studies suggest that being in a dual career couple has greater consequences for women rather than men, in terms of career progression, mobility and work–life balance (Ackers, 2004; Deitch and Sanderson, 1987; Mason et al., 2013; Monk-Turner and Turner, 1986; Rusconi, 2002). This is also reflected in an academic staff survey in Swiss universities where women were more sceptical of the feasibility of dual career partnerships (Dubach and Stutz, 2013).

Individuals in a dual career couple are confronted with mobility decisions for career advancement, such as applying to an institution abroad and/or following their partner to another institution. In these decisions, women were less likely to relocate for their career, especially when their partner's career was compromised, while men were more likely to move even if their spouses had no job in the new location (Ezrati, 1983). Even when women decided to relocate for their careers, they were less likely to be accompanied by their partner: men stayed behind in their original job and women commuted or separated (Ackers, 2004). Thus, the requirement for mobility for work and career reasons could negatively affect the personal relationships of women in this position.

Women were more likely to follow their partner and 'scale back' their careers, taking a job that might not be in alignment with their qualifications and experience (Ackers, 2004; Becker and Moen, 1999; Ferber and Huber, 1979). Therefore, it is more likely for a dual career household to move due to the husband's career rather than the wife's career, with negative effects on the latter's

career progression. For example, a US study of prestigious postdoctoral fellows showed that women selected less prestigious postdoctoral posts – which led to less successful careers – because they were trying to combine this postdoctoral choice with the needs of a partner or family (Sonnert and Horton, 1995[7]).

The intersection of factors such as gender and age has also been found to negatively affect women (Ackers, 2004; Rusconi and Solga, 2007) due to power relations between partners based on earnings and/or career. In many cases of dual career couples, women are younger and at an earlier career stage than their partners, leading to the 'the progression of one partner (typically the male) taking place at the expense of the career profile of the other partner (typically the woman)' (Ackers, 2004: 37).

This section demonstrates how mobility decisions in a dual career couple can contribute to the decreasing number of women academics after the doctoral/postdoctoral position and to the cumulative disadvantage process on women's careers (Ackers, 2004; Reskin, 2003[8]).

Dual career services: A response to the needs of dual career couples?

The growing number of dual career couples and the intense competition among universities for the best and brightest staff seems to have increasingly shifted the responsibility for dual career couples' decisions from the individual towards institutions (Wolf-Wendel et al., 2003). As a consequence, institutions are under pressure to rethink their policies on recruitment and retention and decide whether they should accommodate these needs.

US institutions have addressed dual career couples' issues since the 1980s through informal pathways. Talent management (attracting, developing and retaining excellent staff) is a major concern for a plethora of US institutions under the growing number of dual career couples. In the 1990s, formal dual career services were introduced and soon integrated within many US university services.

An increasing number of studies on dual career policies at US institutions have been conducted since the 1990s (Fleig-Palmer et al., 2003; Rusconi, 2002; Wolf-Wendel et al., 2000). US institutions were more likely to establish dual career services if they were research-intensive universities or geographically isolated institutions. Research-intensive universities were more likely to provide such services due to the flexibility and the availability of resources, while geographically isolated institutions could enhance their attractiveness to potential applicants through offering dual career services in an area with limited job opportunities (Fleig-Palmer et al, 2003; Wolf-Wendel et al.,2000). Dual career services vary greatly across the institutions in terms of type and duration of services offered, eligibility to the programme, allocated staff and funding devoted to the service and stakeholder involvement (ibid).

In Europe, dual career couples and services have been under-explored until recently. This can be explained by the latest European efforts to address gender inequalities in academia and the limited consideration of dual career couples and/or partner opportunities in studies on recruitment and retention of academic staff in European HEIs. Such considerations have only been documented in recent European studies and reports (IDEA Consult, 2013; Zingg, 2013).

According to a recent European collaboration project,[9] TANDEM (Talent and Extended Mobility in the Innovation Union), dual career and integration services (DCIS) were one of the ways to facilitate mobility of researchers while accommodating family and partners' needs. In this case, dual career services were joined with integration services (childcare, housing, language assistance). Researchers[10] with a partner and/or children ranked dual career and childcare/school as the most important aspects of relocating for a new job next to housing and living:

> *…the existence of dual career services would clearly make a difference on researchers' final decisions if they had more than one job offer.* (Zingg, 2013: 6)

Similarly, academic staff welcomed university policies that provided assistance with seeking employment of spouse, especially when moving to another country, according to studies in Switzerland and Denmark (Dubach and Stutz, 2013; Oxford Research, 2010). However, many researchers do not seem to be aware of such services, especially in countries with existing DCIS (Zingg, 2013). Investment in DCIS benefits not only HEIs, but also the regional and national economy by increasing attractiveness, recruitment and retention of talented staff (Zingg, 2013).

Methodology

The growing importance of dual career couples and the limited information about relevant services in European HEIs led to a small research project, which aimed at filling this gap, raising awareness of and critically evaluating these programmes.

Due to the absence of information on dual career services in Europe, online research in European HEIs was undertaken with a focus on Denmark, Germany and Switzerland. The latter two were forerunners in dual career services, while the research team at the time had respective language skills to access information in their native languages. There is a concern among HEIs about nepotism and positive discrimination in relation to dual career academic couples. However, anecdotal evidence from academics suggests that informal and ad hoc practices are undertaken at institutional level – to a limited extent though – to meet the needs of dual career couples (especially when it concerns top-level professorial posts).

Representatives and coordinators of initiatives and services for dual career couples were contacted asking for further information about these services. European respondents reported that many US HEIs are 'ahead of the game' in relation to dual careers, so it was decided to contact US HEIs with long established dual career services to provide another comparative lens and enrich the data.

The data collected were comprised of online desktop research, email responses and eight semi-structured interviews with representatives from European and US institutions in 2012–13. The interviewees were selected based on their responsibilities and their experience of working with dual career couples. Interestingly, the interviewees were working in different structures within the universities: dedicated dual career units, Provost's office (for US universities), human resource departments and welcome services.

The semi-structured interview guide was comprised of the following themes: the rationale behind these initiatives; the services offered; the implementation process; the benefits of these services for different stakeholders; and the challenges that such programmes entailed. Most of the interviewees had been involved in national initiatives for dual career couples, so they also provided information on programmes available beyond their institutions, which is captured in the following section.

The interviews were recorded and transcribed. They were then complemented by additional documents and sources that respondents provided in relation to these programmes. Thematic analysis was undertaken with the following themes being identified: rationale of the emergence; offered services; eligibility; institutional and individual benefits; and lastly (un) intended consequences of such programmes. Based on these themes, the data identified from the transcripts were moved onto an Excel file, which enabled conducting comparative analysis and identifying similarities and differences across institutions and countries.

It should be noted that dual career services presented below aim to meet the needs of dual career couples in academia irrespective if only one or both of them are pursuing academic careers.

Dual career services in European higher education institutions

A few initiatives have only recently been introduced by institutions in Europe addressing the needs for dual career couples in, for example, Germany, Switzerland and Denmark. These are presented next and are compared with US institutions that have been dealing with the needs of dual career couples since the 1980s, providing a more established approach to dual career practices. Overall, dual career services emerged because HEIs in the USA and Europe wanted to enhance their ability in attracting and retaining talented academic staff in a globally competitive market. In Germany and especially in Switzerland, the introduction of dual career services was framed also in terms of equal opportunities between men and women and addressing gender inequality in HEIs.

Germany and Switzerland seemed to be the forerunners in introducing dual career services in Europe. In both cases, these initiatives were mainly funded by federal bodies to enable HEIs to pilot and explore the effects of providing such services. It should be noted that only a fraction of the HEIs integrated such services within their own structures after the expiry of the respective funding.

In Germany, dual career services started as a pilot programme in approximately 40 German HEIs. After an evaluation process, about a quarter of HEIs incorporated dual career services within the university, as a permanent service. A small number of HEIs have discontinued the programme, whereas some universities have included it as part of the international office or welcome centre, meeting the needs of international staff. There were various reasons for introducing these initiatives, as a dual career coordinator in a German university reported:

> *Universities had to show that they have strategies for competing globally for attracting and retaining staff and some institutions competed in terms of equal opportunity/gender equality actions and then the topic became a trend with other universities starting similar projects even though they were not chosen as excellence universities*

Similar rationales were invoked in Switzerland, where dual career couples were the focus of the third phase (2008–2012) of the Federal Programme, 'Equal Opportunity at Swiss Universities'.[11] This programme was linked to a survey of academic staff at Swiss Universities. It showed that female academics were under greater pressure to balance career, family and partnership compared to their male colleagues, to the detriment of their careers (Dubach and Stutz, 2013). The programme, thus, targeted the enhancement of the representation of women in top academic posts in Swiss HEIs so that the number of women will reach 25% of full and associate professors and 40% of assistant professors in Swiss institutions by 2013. While the programme did not meet its targets, one of the researchers involved in the evaluation of the Swiss programme highlighted that it was still beneficial in raising awareness and helping the institutions to familiarise themselves with the issue of dual career couples:

> *Through the financial incentives and the 'agenda setting' of the programme – the universities gained practical experience in hiring dual career couples. For most universities, this wasn't a standard procedure before.'*

In Denmark, dual career services emerged because HEIs wanted to retain international researchers. Nevertheless, there were concerns that international staff would decide to leave the country if their spouses were unhappy and could not continue their careers (Oxford Research, 2010). In addition, these services seemed to be of benefit to dual career couples, institutional structures and the national economy, as illustrated below:

> *For example, spouses who get these services, feel valued because they get tailored information and advice. Their hired partners are happy that their spouses were benefited by the services. Departments found*

helpful not to use their own resources but having a central unit that deals with these issues. In addition, private companies are benefited through a pool of highly profile candidates that are coming along with academics. For example, there is an expert fair organized annually where spouses are invited to network with companies in Denmark. [Danish university representative]

What services and for whom?

Dual career services vary across institutions and countries. The most common services offered for dual career couples (where one at least is an academic) are advice on CVs, applications and interviews, guidance on job search, information on the local and national labour market, career workshops, networking events and access to employers and institutions in the region. Complementary to these services, but also significant, are the so-called integration services that offer guidance and support in relation to childcare, housing, language courses and advice on mortgage and tax issues.

In Denmark, at the University of Copenhagen, spouses of international staff are supported in their effort to find employment with tailored advice on CVs and career workshops. While everybody is eligible for these services, there is a VIP staff category, which includes newly appointed professorial staff. These applicants are offered additional services, such as tailored information and integration services for childcare, housing and professional advice with taxes and mortgage. This is similar to the USA, where partners of faculty hires were top priority (Fleig-Palmer et al., 2003; Wolf-Wendel et al., 2000).

There are specific services and practices for dual *academic* career couples, such as dual career hiring and split/sharing positions, which seemed to be more established and formalised in the USA. In Europe, these approaches happen more informally and on ad hoc basis for top professorial positions. A few German HEIs refer to dual academic career couples on their websites, offering support for partners pursuing academic careers and providing access to available vacancies within the university or local academic institutions that they collaborate with.

In Switzerland, the federal programme allocated funding for both individual (targeted at dual *academic* career couples) and structural measures. Career development support for individual partners' (of first hires) careers was co-funded by Swiss universities (50% programme funding and 50% from hiring universities). The fund operated on a first come first served basis and benefited 27 dual career couples (support on an individual basis). Most of the funded cases (over 65%) concerned professorial appointments, while the rest were junior research posts. In terms of gender, eight women received a professorial post and the majority of women were the second hires in the funded cases (21 of the 27 couples). At the time of the report, eight women were in follow-up jobs initially funded by the programme. However, more time is required to track the career development of this group and evaluate the long-term impact of this initiative.

Structural measures led to the development of structures that enabled universities to implement processes for dual career couples (bodies/offices, websites). Swiss HEIs adopted different approaches on how to use this funding. HEIs in the German-speaking region developed institutional proposals based on their priorities (studies on the current situation, what needs exist, creating welcome/dual career services), while those from non-German speaking-regions submitted a joint project leading to an internet platform called *carriere2*, a needs analysis report and raising awareness of dual career couples (Dubach and Stutz, 2013). While most universities have developed websites in relation to dual career couples, the engagement of Swiss universities with dual career couples has been limited either in financial terms of developing specific guidelines or dedicated structures regarding the appointment of dual career couples.

What seemed to be common in most institutions was that the partners of newly appointed staff for 'professorial positions' or top scientists were eligible for these services, in line with previous

research in Germany and Switzerland (Dubach and Stutz, 2013; Rusconi and Solga, 2007). In Germany, Goethe University Frankfurt and Dresden University offer dual career services to partners of postdocs who work on excellent research clusters and are international junior scientists, respectively. While an exception to the rule of professorial posts, the rationale of the best and the brightest is very clear in these practices.

But are dual career services reinforcing gender inequalities?

Examining the dual career services with a gender lens, there are two issues that need to be discussed, especially when it comes to dual academic career couples (where both partners aspire to an academic career): eligibility and workplace culture and assumptions.

As discussed earlier, most dual career programmes are available to newly appointed professors. Since women are under-represented in professorial positions, such initiatives become problematic and gender-constructed and reproduce gender inequalities. Gender power relations become pertinent since by restricting eligibility to professors, there is a differential distribution of power translated into access to these beneficial resources. On the contrary, more emphasis should be given at the entry level of academic careers, such as the postdoctoral level, where men and women are more equally represented. Therefore, eligibility to these programmes should be open to all career levels, especially at the early career stage where there is more precarity and low pay and benefits. In addition, issues of childcare, housing and financial assistance are more critical than for comparably better-paid professors. One of the interviewees raised the difficulty of convincing the institution to integrate such a programme and a recurring question was emerging:

> *Why should a university invest in partners of junior researchers as they are to leave the institution after a few years at the latest? (Swiss HEI employee)*

However, meeting the dual career needs of this group entails benefits for both the couples and the institution. Dual career couples enhance their international mobility with a favourable effect on career progression, work–life balance and overall quality of life. Dual career opportunities for researchers at all career stages are not only tools to increase attractiveness, but also to retain an excellent and diversified body of researchers. It could also contribute to gender equality strategies of HEIs.

The second issue is linked to eligibility, but is more pertinent to the notion of gendered organisations, workplace culture and gendered assumptions, especially when a dual career couple is comprised of two academics. For example, anti-nepotism policies and assumptions at HEIs about traditional gender roles can limit the career prospects of women in dual career academic couples, reflecting gendered assumptions about individual attitudes and ambitions. Support for partners was more likely to be offered by institutions when men (rather than women) asked about support towards their partners. Appointment committees did not view women favourably when they referred to the need for dual career support (Rusconi and Solga, 2007). Furthermore, as Henderson reported (2007: 46):

> *In many cases, accompanying partners are subject to the personalities and informal practices of various departments. When the accompanying partner is female, potential employers may assume that her ambitions are limited enough to accept a position that is beneath her qualifications (or no position at all).*

Similar concerns have been echoed in US studies that recommend dual career hiring as a practice in which HEIs should consider meeting the needs of dual academic career couples (McNeil and

Sher, 1999; Schiebinger et al., 2008). While this practice has existed since the 1970s in US institutions, it grew from 3% to 13% in 2000 (Schiebinger et al., 2008). In a study of academic faculty in 13 top US research institutions, it was found unsurprisingly that women were often the second hires in a couple, demonstrating the higher leverage that male scientists have as a first hire at an institution. As mentioned before, this is often justified by the differences in terms of age and career stage, where men are more likely than their female partners to be older and seeking a high status position (McNeil and Sher, 1999; Schiebinger et al., 2008). Only a small proportion of male academics (19% compared to 53% of women) who were first hires for professorial posts had partners seeking similar posts (Schiebinger et al., 2008). In addition, HEIs are well aware of the two-body problem and might use it to exploit the needs of dual academic career couples to find a job at the same location. For example, HEIs are likely to offer jobs for both partners that would be paid less than when hiring two different academics, or offer jobs at a lower level than desired by both partners or in particular by the second hire (McNeil and Sher, 1999; Wolf-Wendel et al., 2003). Since second hires are often women, it is more likely that such situations work to the detriment of women's careers. Split or shared posts – which can be found in the USA but not in Europe, at least not in a formalised way – have been suggested as a beneficial solution for both institutions and individual scientists in dual academic career couples in the same discipline and at an approximately similar career stage (McNeil and Sher,[12] 1999). For example, in the field of physics, the low density of physicist jobs along with the low likelihood for a dual academic career couple to find professional employment can lead to physicists leaving physics, a loss for the profession. In addition,

> *As these employment problems are more acute for women, lack of attention to dual-career issues can hamper efforts to increase the representation of qualified women in physics.* (McNeil and Sher, 1999: 2)

Finally, when policies for dual academic career couples are not transparent and clear, 'second hires' might be perceived as an 'add-on' to the first hire and the professional expertise and competences of the second hire are likely to doubted and challenged (Wolf-Wendel et al., 2003). Therefore, such practices can be characterised as reinforcing gender inequalities due to the lack of clarity and transparency.

Conclusions

Dual career couples in academia are a common phenomenon in both the USA and Europe. Considering the increasing proportion of women completing doctoral degrees and participating in the academic labour market, along with the inclination of women to be the partner of another academic, it is expected that the number of dual academic career couples in academia will continue to grow. While being in a dual career couple entails benefits for both partners in terms of mutual understanding and common interests, dual career couples are confronted with many challenges, which affect their career advancement, personal relationships and work–life balance. In an era of intense competition in the academic labour market and increasing requirement for mobility, dual career couples find it difficult not only to find two jobs at the same place, but more importantly to get posts that will enable them to fulfil their career aspirations.

However, there are caveats, especially when this topic is examined with a gender lens. It is highlighted that the pressure for international mobility is a gendered practice in the academic labour market since it affects women more negatively – in terms of career advancement and work–life balance – especially when they are in a dual career couple rather than men. Mobility is based on the assumption that academics, as ideal workers, would be free to move to different institutions, develop their expertise and foster international networks without consideration of implications or

disruptions that this might have on their personal life. Women's mobility seems to be constrained by various reasons: the ticking of the 'biological clock'; the prioritisation of men's careers due to a combination of higher social and occupations status; and higher remuneration and age difference. These are also due to gender attitudes and assumptions about traditional gender roles.

Services for dual career couples are emerging in Europe following the example of well-established programmes in the USA. They provide career support (job search, CV and application advice, interview training, networking with local employers) for the partners of the new recruits and often offer childcare, housing and relevant integration services to the dual career couple. Recipients of dual career services experience a smoother transition to a new working and living environment alleviating work–life balance pressures, and they are more committed to an institution that recognises and supports their personal needs. This again has positive effects on their motivation and performance. Dual career couples feel valued and welcome services that would enable them to integrate in a new community and help them in pursuing fulfilling careers for both partners. Finally, it is the national and wider research system as such that profits from HEIs being known as attractive employers. Hence, dual career services can become an important competitive advantage in the labour market for research institutions and the local economy, if implemented properly and extensively. Overall, DCIS are a positive step that HEIs should consider. These services provide a signal to employees that HEIs acknowledge the pressures that dual career couples come across in a global academic marketplace and they are willing to help with work–life balance issues.

While these services are driven by the global competition of HEIs to attract and retain international excellent staff, German and Swiss initiatives have drawn particular attention to the benefits that these programmes could entail for the promotion of female careers and the retention of women in academia. However, gendered issues are raised in relation to dual career services, in terms of eligibility and workplace culture/assumptions, especially when it comes to dual *academic* career couples (where both partners aspire to an academic career as shown in US studies).

Concerns about the fairness, legality and meritocracy of dual career practices have been raised in US institutions (Schiebinger et al., 2008), which need to be addressed by the development of clear and transparent guidelines and policies. Clarity and transparency of dual career policies are pivotal and they need to be combined with institutional efforts to review gendered practices and cultures. In this way, they can address the abovementioned caveats of eligibility and workplace culture and have the potential to contribute to the current efforts of HEIs to addressing gender inequality in academia.

This paper raises the significance of considering dual career couples in institutional policies that aim for an internationally excellent and diversified academic workforce. However, dual career services are not a panacea for institutions that want to attain recruitment, retention and diversity goals. HEIs need to conduct a thorough assessment of institutional needs in relation to dual careers, and then examine and plan accordingly which practices best fit their needs. There are challenges in running such programmes and they should be designed carefully in alignment with the profile and mission of the institution. These challenges concern a range of issues, such as the following: sustaining institutional, financial and administrative support; availability of employment opportunities in the local context; dealing with visa-limited candidates; managing expectations; clear communication about dual career services; and ensuring the integrity of the programme, especially in cooperation with business partners.

Dual career couples in Europe remain an under-researched area in the academic literature. Further research is required to explore a plethora of issues. Initially, it would be imperative to map out the population of dual career couples in Europe to get an overview of the 'two-body' problem and how prevalent this phenomenon is in European countries. In addition, it is important to

investigate the decisions, needs and challenges of this population. Rusconi (2002) highlights the importance of undertaking longitudinal studies of dual career couples at different career stages, which will enable researchers to understand the difficulties and the dynamics of decision-making processes at different career stages. By getting a better insight into these issues, it will potentially enable the development and improvement of policies at different levels (international, European, national and institutional) for meeting the needs of dual career couples in science and academia, along with fulfilling the aims of academic excellence and gender equality.

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Declaration of Conflicting Interest

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Notes

1. This survey was sent to all academic staff in all Swiss universities and the Federal institutes of technology in 2011. The response rate was 36% (10,635 respondents), with 48% participation from women and 29% from men. In terms of disciplines, employees in humanities and social sciences were overrepresented whereas those from medicine and technical sciences were under-represented.
2. It should be noted that 27% of respondents live with an employed partner but do not fulfil the dual career couple criteria, either because one partner works less than 80% full-time equivalent (FTE) and/or one partner does not have a higher university degree (this is quite limited.)
3. According to Schiebinger et al. (2008), the term 'disciplinary endogamy' reflects the tendency of academics to couple in similar fields of study and are often found in the very same department.
4. The respective proportions of male married physicists were 6% and 17%.
5. According to administrators and affirmative action officers in German universities, rejection of university posts in German institutions was often related to dual career considerations.
6. In this study, 88% of dual career faculty from US institutions would have not accepted their position if their partner was not hired as well.
7. In this study, 62% of married women and 19% of married men had a spouse with a doctorate. This project was based on 699 questionnaire responses and 200 interviews with recipients of National Science Foundation (NSF) and National Research Council (NRC) postdoctoral fellowships.
8. According to Reskin, the process of cumulative disadvantage is based on a combination of factors along with 'non-events' (for example, the decision not to take a more prestigious postdoc due to incompatibility with partner's career), which affect cumulatively a woman's career resulting in great inequality at senior career stages between men and women.
9. The project partners were the Dual Career Advice and Integration Services (ETH Zurich and University of Copenhagen) and the Euraxess Service Centres (in Bratislava, Copenhagen, Tartu, Thessaloniki and Zurich).
10. The survey was sent to researchers in the countries of the project partners but also reached researchers in France, Spain, the UK and the USA through the Euraxess network. Most of the respondents were doctoral and postdoctoral researchers. More than 3000 researchers and their partners responded to the survey (mainly from Europe).
11. The Federal Programme is still continuing (SUK Programme 4-2013-2016), but finishing soon. This

programme aims at funding the implementation of institutional action plans rather than separate projects/individuals as was the case in the previous phases.

12. In 1998, McNeil and Sher conducted a web-based survey for dual science career couples with over 630 responses, which includes narrative responses. In this study, eligible respondents were couples comprising at least a physicist and another scientist (often a physicist though). Therefore, 89% of the respondents had partners who were scientists, while almost 50% of the respondents were dual career couples in physics. The report can be found at the following link: http://www.physics.wm.edu/~sher/survey.pdf

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EERJ

Should I stay or should I go? The effects of precariousness on the gendered career aspirations of postdocs in Switzerland

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Abstract

The assumption that men are more likely to undertake and succeed in an academic career, because the requirements of professional success in this occupation are compatible with normative gender assumptions, particularly that of fulfilling a 'male breadwinner' or main household earner role, implying reduced domestic and care commitments, is discussed. It is suggested that Switzerland offers a particularly interesting case for this study, because of the combination of the specific structure of academic careers, the characteristics of the non-academic labour market and the dominant gender regime. It is shown that, in this particular context, the aspirations of postdocs to remain in academic employment or to look for non-academic jobs are directly related to their position within the domestic division of labour and to their personal and family circumstances. However, this does not necessarily lead to a clear-cut divide between work-committed men, who 'succeed' (and hence stay), and care-committed women who 'fail' to climb up the academic career ladder (and hence leave). The results suggest that the situation is more complex and requires a subtle distinction between different ideal-types of post-doctoral experiences that do not always cut neatly across gender lines.

Keywords

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Introduction

Much recent research on the academic profession from a gender perspective has been framed in relation to the dual notions of the so-called 'glass ceiling' and the 'leaky pipeline'. The former term has been widely used in the literature on gender and academic careers to suggest that, 'women are more likely than men to leave science at multiple time points from the beginning of college through academic tenure' (Miller and Wai, 2015: 1). The leaky pipeline approach moves beyond analysis of inequalities in terms of academic career paths, productivity or gendered specialisms, in order to focus on the processes of inclusion/exclusion within a particular occupation or institution (Dubois-Shaik and Fusulier, 2015). Building on a previous tradition of looking at the 'revolving door' into and out of academic jobs (Tancred and Hook Czarnocki, 1998), 'scholars from diverse fields have proposed how specific factors such as cognitive abilities, discrimination, and interests can explain these gender differences in opting out' (Miller and Wai, 2015: 1).

Many explanations of the specific difficulties that women may face in academia focus on work–life balance issues (Le Feuvre, 2013). On the one hand, research focusing on the organisation of academic work has defined universities and research centres as particularly 'greedy institutions' (Coser, 1974; Currie et al., 2000) that are relatively insensitive to the potential family-care and domestic commitments of their research staff. According to this perspective, the androcentric character of academic organisations and a normative model of science as requiring 'total commitment' (Case and Richley, 2013: 329) are the main organisational factors that are said to keep women (and the minority of men with caring responsibilities) from reaching the pinnacle of the academic hierarchy (Beaufaÿs and Krais, 2005). This marginalisation often implies difficulties in accumulating the assets needed to obtain a tenured position, based on what some authors have called a 'Mathilda effect' (Rossiter, 1993), whereby minor differences – in commitment or research productivity – at strategic points at the beginning of the academic path translate into significant gender differences in terms of final career outcomes (Fassa and Kradolfer, 2010).

Other research has focused more on the subjective experiences of women in the academy and has stressed the difficulties they face in managing the potential cognitive dissonance between the high demands of an academic job and the emotional commitment to family members, including partners and children (del Río Carral and Fusulier, 2013). Some scholars have suggested that it is because women are more likely than men to aspire to a form of dual or combined commitment – to their families and their jobs – that they are disadvantaged in the highly competitive academic labour market (Marry and Jonas, 2005). This hypothesis is supported by another strong assumption – that men are more likely to undertake and succeed in an academic career because the requirements of professional success in this occupation are compatible with the normative gender assumptions associated with fulfilling the role of 'male breadwinner' or main household earner.

From this brief summary of the literature it can be seen that the leaky pipeline metaphor is usually based on at least three implicit assumptions.

- First, that the exit of PhD holders from the academy is potentially to their disadvantage (i.e. 'stayers' have the opportunity to progress to the top of the academic employment hierarchy, whereas 'leavers' are deprived of such career opportunities and are ultimately disadvantaged in terms of pay, recognition and/or job satisfaction).
- Second, that the potential for achieving a satisfactory level of work–life balance is higher in non-academic jobs than in the higher education and research sector.
- Finally, third, that the spill-over effects of academic employment on personal life and family configurations (and vice versa) will have a greater impact on the occupational aspirations and outcomes of women than on those of men.

In this article, we propose to discuss and question these assumptions using the narratives of male and female postdocs in Switzerland. Our analysis is based on secondary analysis of national statistical data and on biographical interviews with a selection of men and women who have occupied a post-doctoral position in a particular Swiss university at some point in their career and who have since left the academy.[1]

In the following sections we will study the leaky pipeline phenomenon in the light of several characteristics of the Swiss context, notably the academic career structure, the main features of the non-academic labour market and the dominant gender regime. We will then present an analysis of the postdocs' aspirations regarding pay and working conditions. Finally, we will analyse in more depth the experiences of the so-called leavers, to identify the circumstances and experiences that led former postdocs to quit their academic jobs, in order to determine the role of work–life balance issues and of gender role assignations in these processes.

The 'leaky pipeline' in historical and comparative perspective

Towards a de-standardisation of the traditional academic career path

Given the massive over-representation of men at the top of the academic hierarchy across the globe, it is reasonably safe to conclude that this occupation is still a male bastion, despite increases in women's share of professorships in many national contexts in recent years (European Commission, 2015; OECD, 2015). It is also clear that, in a wide range of countries, employment conditions for researchers in academic institutions have evolved considerably over the past decades, notably through the unprecedented development of part-time and fixed-term contracts (Ylijoki, 2010; Murgia and Poggio, 2014). These changes to the terms on which academics are recruited have led some authors to announce the emergence of a 'post-Fordist precarious university' (Casas-Cortés and Cobarrubias, 2007: 112), where fixed-term contracts and 'episodic employment' (Ylijoki, 2010) have replaced the more predictable and stable academic career paths of the (sometimes over-romanticised) past.

However, in their overview of the academic profession in comparative perspective, Christine Musselin and Jürgen Enders noted that academic careers have always been based on a combination of flexible and stable positions. Even in the past, in most national contexts such careers began with a period of 'apprenticeship and fixed-term positions' before selected individuals were admitted to the second stage of 'permanent positions', usually on the basis of satisfying given criteria for measuring professional performance or 'excellence' (Enders and Musselin, 2008: 134). Although the frequency of the transition from first to second stage varied significantly from one country to another (e.g. in terms of the expected duration of the first stage, or the criteria for access to the second stage), it was nevertheless possible to identify a common 'two-stage pattern' of academic careers across different national contexts (Enders and Musselin, 2008: 134). However, some authors suggest that an erosion of this two-stage career pattern is currently underway in many countries. Through the widespread adoption of new competitive research funding procedures and individualised performance evaluation criteria (Enders, 2001; Ferlie et al., 2008; Schultheis et al., 2008), it would appear that '…the career based on a two-stage pattern is no longer the only one available within the academic profession' in Western universities (Enders and Musselin, 2008: 134).

The relationship between these changes to academic career structures and the dissemination of so-called new public management principles is open to debate, as is the degree to which the two-stage academic career model has been universally eroded. In some countries, 'the proportion of traditional permanent positions has tended to diminish, whereas the number of non-tenure track

positions has increased' (Enders and Musselin, 2008: 134). This is the case in the USA, where the proportion of the academic labour force engaged on fixed-term contracts has increased from 43% in 1975 to 64% in 2003 (Ehrenberg, 2006). Similarly, in the UK it has been estimated that by the end of the 1990s, more than 50% of academic staff were employed on fixed-term contracts (Bryson and Barnes, 2000); and in Finland the number of contract researchers increased almost 2.5-fold between 1994 and 2004 (from 2205 in 1994 to 5106 in 2004: see Ylijoki, 2010).

Elsewhere, notably in countries where academics are still employed as civil servants, the erosion of the two-stage model has been less spectacular. In France, for example, the majority of those who 'survive' the years of intense competition that follow the awarding of their PhD can expect to progress relatively quickly onto a permanent tenured position, first as Senior Lecturer (in less than 5 years after the PhD), then as full professor (within 12 years). The internal structure of the French academic labour market has thus not changed significantly over the past 25 years (Bideault and Rossi, 2013, 2014; MENSR, 2014), although the duration of the first career stage has undoubtedly lengthened considerably. However, there are only limited opportunities for funding postdocs via a succession of fixed-term contracts within the same institution. According to data from the Ministry of Higher Education and Research, 23.6% of French academics were engaged on fixed term contracts in 2012, as against 19.8% in 1992 (MENSR, 2014). These fixed-term contracts mostly concern funded PhD students and early postdocs (*Attachés temporaires d'enseignement et de recherche* – ATER) and not those who are more advanced along the academic career path.

Despite variety in the speed and extent of these changes, it has been argued that '…the growing external constraints and demands have shaped the ideals, work conditions and practices into a similar mould across all university settings, creating common tensions and challenges in academic work' (Ylijoki, 2010: 368). In national contexts where such changes have been particularly strong, one can observe that 'fixed-term staff no longer form a marginal or exceptional phenomenon within academia, but rather the most common and continuously growing group of the personnel' (Ylijoki, 2010: 368–369). Taking account of these evolutions in a large number of national academic labour markets, we argue that this trend towards the de-standardisation of academic career paths may make the leaky pipeline less of a feminine phenomenon, since some men may abandon any plans for an academic career simply because the entry conditions to this occupation are no longer compatible with a normative, 'breadwinner' model of masculinity.

The Swiss academic labour market: a growing PhD and postdoc 'bubble'

Due to the structure of academic careers, the characteristics of the non-academic labour market and the dominant gender regime, Switzerland offers a particularly interesting case for analysing the implications of the erosion of the two-stage career model for the gendered characteristics of exits from the academic career path. The Swiss university system is based on the 'Humboldt' model of organisation, imported from Germany (Kopp, 2014). In line with this model, Swiss universities were traditionally organised around disciplinary faculties and Institutes (*Lehrstuhl*) chaired by a single full professor. Within this system, academic personnel were traditionally divided into two distinct categories. At the top of the academic hierarchy were the full professors or 'chairs', i.e. academics who were employed on a permanent (tenured) and usually full-time basis, to teach, carry out research and to manage the daily running of their Institute. At the relatively lower stages of the academic hierarchy stand the *Mittelbau* (or *corps intermédiaire* in French) – that is, PhD students hired as assistants, postdocs or junior academics who are also expected to teach and do research, but who are recruited on temporary, usually part-time, fixed-term contracts and who work under the authority and leadership of a full professor or chair (Musselin, 2009: 23). In order to progress to a permanent position, members of the upper *Mittelbau* had to wait – sometimes for a
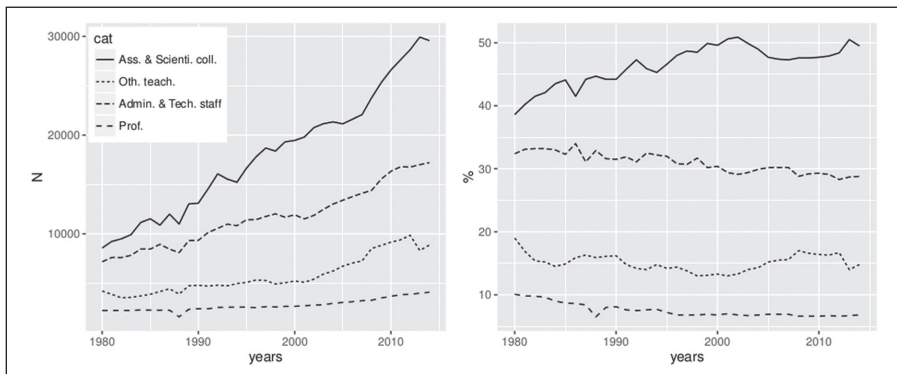
Figure 1. Evolution of Swiss academic staff (1980–2014).
Source: Federal Statistical Office (FSO), 2016.

very long time – for a permanent position to become available, usually through the retirement – or untimely death – of their immediate hierarchical superior (Schultheis, 2000).

This so-called Humboldtian organisational model is associated with what some researchers have termed a 'survivor career pattern' (Enders and Musselin, 2008: 134–135). To reach a permanent position, intermediate level academics had to find the means to survive this long period of precariousness and dependency on their professor and had to accept the constant competition with their peers in the *Mittelbau* for the opportunity to move onto a permanent professorial position. As Franz Schultheis (2000) has argued, at the end of the 19th century the availability of inherited wealth (or even the financial support of a working wife) was the condition for maintaining what Durkheim had already referred to as the 'academic proletariat' of the German university system.

In a context of rapid expansion and internationalisation of its higher education sector since the beginning of the 2000s, Switzerland has started to move away from the Humboldtian model and to experiment with new kinds of junior and intermediate academic positions, whilst to a large extent maintaining their temporary nature. Innovative policies to support the PhD and postdoctoral careers of young researchers have been adopted, notably by the Swiss National Science Foundation (SNSF) (Fassa and Kradolfer, 2013). This foundation, created in 1952, is mandated by the federal government to support research in all academic disciplines, from anthropology to medicine or engineering. Although other research funding bodies exist in the country, the SNSF is the main source of funding for early stage academic careers in Swiss universities. Through the SNSF programmes, tenured academics can apply for project-based research funding (e.g. for buying laboratory equipment, hiring PhDs or postdocs, covering fieldwork expenses), usually for a period of 3–4 years at a time. The SNSF also supports other scientific activities, such as conferences, publications, etc. However, most of the funds provided by the SNSF are spent on scientific support staff (individually or as part of a project team). In 2013, 73% of the funds allocated by the SNSF were dedicated to 'financing individual salaries and/or fellowships in the context of career funding or for the appointment of staff (including PhDs) to work on SNSF-funded research projects' (SNSF, 2015: 13).

The (temporary) competitive funding opportunities provided by the SNSF – and other foundations or institutions – have undoubtedly increased the number of PhDs and *Mittelbau* who are able to undertake the kind of research that will enable them to apply for a professorship at some (distant) point in the future. However, since the number of permanent positions in Swiss universities has remained relatively stable over time (see Figure 1), the proactive support of young academics has led to the emergence of a large PhD and postdoc 'bubble' (Theodosiou et al., 2012).

The internal structure of the Swiss academic labour market shows that the number and relative weight of the *Mittelbau* (i.e. 'Assistants and Scientific Collaborators' and 'Other Teachers') increased considerably over the period under study. Growth was particularly rapid for the first category, where the chances of being engaged on a fixed-term contract are higher than in any other case. This group, which includes the doctoral students employed as teaching assistants and post-docs, represented almost half of the academic population in Swiss universities in 2014, as against 40% in 1980. This increase is partly due to the fact that the number of (funded) PhD positions has doubled since 1990 (SERI, 2014: 32). However, the number of fixed-term postdoc positions has also increased, to approximately 8000 in 2011 (SERI, 2014: 25). Over the same period, the more stable category of the *Mittelbau* (other teachers) decreased by 5%, as did the proportion of full professors. The academic career structure has thus become increasingly 'bottom heavy' over time. In 1980 there were 4 (temporary) assistantships or scientific collaborator positions for every full professorship: by 2014, this figure had doubled (to 8).

These changes suggest that competition for a permanent professorial position has intensified over the past 25 years. This is compounded by the undeniable attractiveness of Swiss universities for foreign academics, particularly those from the neighbouring countries of France, Germany and Italy. At present, over 45% of full professorships in Switzerland are held by foreigners (Goastellec and Pekari, 2013). For this reason, the country provides a particularly interesting case study for our analysis of the effects of the de-standardisation and increasingly competitive character of the academic labour market on the gendered career and family-care aspirations of young researchers.

The Swiss socio-economic context and gender contract

Because the national environment has a significant influence on the structure of academic labour markets (François and Musselin, 2015), it is important to analyse the wider socio-economic context and normative gender regime in Switzerland, in order to understand better the context in which young researchers construct their career aspirations and employment practices.

Full employment and frequent qualified labour shortages

In the current European climate of high unemployment and economic recession, Switzerland stands out as something of an exception. Indeed, with an unemployment rate below 5% since the end of the 1990s, the Swiss economic context can be described as healthy and stable, especially in comparison to its neighbouring countries such as France or Italy that have been badly hit by the post-2008 economic recession and subsequent public spending restrictions.

One other significant characteristic of the Swiss context is the relative shortage of skilled labour. In comparison to countries like Canada or France, there is a relatively small pool of tertiary-level graduates in Switzerland. In 2011, only 20% of 18 year olds had passed the national qualification providing direct access to higher education institutions, as compared to 68% of French and 51% of Canadians from the same generation (Kamanzi et al., 2014). This dearth of university-educated workers can be partly explained by the social prestige associated with vocational training in the Swiss context and by a highly segregated secondary school system, where selection to the higher education track is highly competitive and occurs relatively early within the educational trajectory, at about the age of 12 (Kamanzi et al., 2014: 174).

A direct consequence of this selective system is a long-term shortage of highly skilled workers in the Swiss labour market. According to a recent survey, 41% of Swiss employers declare that they are facing a 'talent shortage' and are struggling to find staff with skills adapted to their needs (ManpowerGroup, 2015). Among the difficulties faced by employers, the survey cites the lack of

suitably qualified candidates (ManpowerGroup, 2015: 13). Because of this shortage, many Swiss companies tend to recruit their qualified staff members from abroad (Wanner, 2004). A study has shown that, in 2009, no fewer than 64% of the top managers from the 200 largest Swiss companies were foreigners, whereas this was the case for only 22% of the top managers in France and 27% in Germany (Davoine and Ravasi, 2013). As we have already seen, this is equivalent to the proportion of foreign professors in Swiss universities.

The Swiss 'modified male breadwinner' gender regime

In the wider context of (almost) full employment, Switzerland has evolved over the past twenty years towards the widespread adoption of a 'modified male breadwinner' (Crompton, 1999) or 'neo-maternalist' (Giraud and Lucas, 2013) normative model of gender relations. Swiss women now have relatively high economic activity rates and represent 45.5% of the labour force (UNECE, 2014). However, they tend to work part-time (at 62.2%, a rate second only in Europe to the Netherlands) and/or to take extended breaks from the labour market when their children are young (UNECE, 2014). The division of domestic labour is particularly unequal. In 2010, women spent 4 hours and 25 minutes on average a day on domestic activities, whilst men spent only 2 hours and 41 minutes (UNECE, 2014). Several recent studies have shown that this particular pattern of female activity rates and family organisation is explained by a combination of fiscal policies that are unfavourable to dual-earner households and the lack of affordable childcare, both for pre-school children and for extra-curricular activities for older children (most junior schools do not provide a canteen service at lunch-time, for example) (Bütler, 2006; Schwegler and Schultheiss, 2014). This modified male breadwinner gender regime is thus bolstered by a number of structural characteristics of Swiss society, such as the very low levels of childcare or elderly care provision, or the extremely expensive childcare costs, long working hours for full-timers and a low rate of male unemployment.

A more specific focus on this gender regime reveals the extent of the horizontal and vertical segregation in the labour market and a relatively large gender pay gap, particularly at the upper reaches of the occupational hierarchy. Although there has been a considerable improvement in women's access to higher education over the past 15 years, the academy continues to demonstrate a glass ceiling (Fassa and Kradolfer, 2010). Women are well-represented amongst doctoral students and make up a significant proportion of temporary research positions, but they are much less likely than their male counterparts to reach permanent professorships (European Commission, 2015). In 1998, women represented only 7% of full professors. Largely thanks to a number of well-funded federal equal opportunity programmes (Fassa and Kradolfer, 2013), their numbers have increased significantly since 2000, however. Women now represent around 20% of full professors in Switzerland (Figure 2), but with large variations according to disciplinary field (Fassa et Kradolfer, 2010).

To summarise, we can see that Switzerland is characterised by a large PhD and postdoc bubble, a buoyant labour market, a significant skills shortage and a modified male breadwinner gender regime. This context shapes collective representations of what it means to become an academic for those who make up the potential recruitment pool.

Research questions and data

'Leavers' and 'stayers': the complexity of the leaky pipeline in the Swiss context

Table 1 presents the results of a survey among young academics (mostly postdocs), engaged in one of the Swiss universities, regarding their intention to pursue (or not) an academic career.
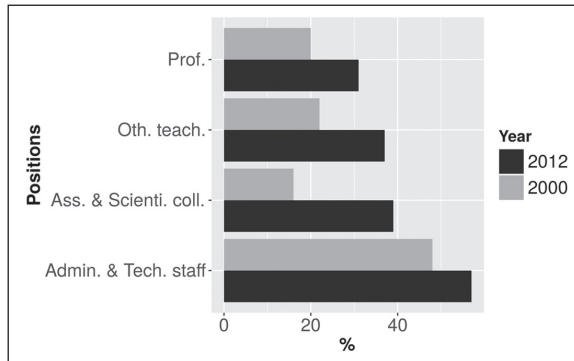
Figure 2. The evolution of women's share of different types of academic employment, Switzerland, 2000–2012.
Source: FSO, 2016.

Table 1. Declared intention to pursue an academic career amongst postdocs in Swiss universities, according to nationality and gender, in 2011 (%).

Nationality	Gender	Definitely	Probably	Probably not	Definitely not	Don't know	Total	Number
Foreign	Men	52	32	9	2	5	100	780
	Women	39	39	13	3	6	100	737
	Total	**46**	**36**	**11**	**2**	**6**	**100**	**1517**
Swiss	Men	37	31	21	5	6	100	431
	Women	34	32	23	6	4	100	449
	Total	**36**	**31**	**22**	**6**	**5**	**100**	**880**

Source: Dubach (2014: 15).

Two main findings appear particularly interesting here. First of all, the Swiss postdocs are less likely than their foreign counterparts to envisage an academic career in the future. They are 11% more likely to declare that they *probably* will not pursue an academic career and 4% more likely to state that they *definitely* do not want to undertake an academic career. Second, amongst the foreign (i.e. non-Swiss) postdocs, men are more likely to aspire to a future academic career than women: 52% of the foreign male postdocs declared that they definitely intended to follow an academic career, as against only 39% of their female counterparts (a difference of 13 percentage points). Amongst the Swiss postdocs, however, the gender difference is remarkably smaller (a difference of 3 percentage points). In other words, Swiss men do not seem to be significantly more attracted to an academic career than their female colleagues.

As mentioned previously, Swiss women are more likely to be assigned to family-care tasks, which are rarely shared or externalised under the dominant gender regime, where most men are assigned to the 'main breadwinner' role (Giraud and Lucas, 2013). This unequal share of domestic labour has often been used to explain why women fail to reach stable professorial positions in Swiss academic institutions (Fassa and Kradolfer, 2010). However, we would argue that the recent changes to the academic career path that we have outlined above may explain why Swiss men are, today, no more likely than their female compatriots to aspire to an academic career. In the next sub-section, we will introduce life history and biographical data to

Table 2. Interview sample.

		LS (%)	SSH (%)
Nationality	Swiss	85	25
	Foreign	15	75
Gender	Female	50	55
	Male	50	45
Professional status	Fixed-term postdoc position	45	40
	Permanent or tenure track academic position	35	45
	Working outside academia	20	15
Total (N)		20	20

illustrate a specifically male 'up or out' pattern of exit from the academy. Our data suggest that, compared to the alternative opportunities available to male PhDs on the Swiss labour market, the uncertainty surrounding the eventual outcome of a succession of fixed-term postdoc positions may make the prospect of an academic career rather unattractive to some men, particularly if they aspire to fulfilling rapidly a normative 'main (male) breadwinner' role. This suggests that those men who believe that they do not have the academic record (or support networks) required to reach a stable academic position within a reasonable length of time (e.g. up to 5 years after the PhD) will start looking for more stable and well-paid jobs, either in industry or in the Swiss administration. Formally, they are 'leavers', but their pathway out of the academy is very different to the one followed by those men (and women) who are less preoccupied with conformity or accountability to gender norms (Le Feuvre and Zinn, 2013) and by those women who are faced with the imperative to reconcile their work and family lives (Lapeyre and Le Feuvre, 2004).

Data and methodology

The analysis that we present in the following section is based on qualitative data collected in the context of a European research project focusing on gender inequalities during the early stages of academic careers. We conducted 40 interviews with postdocs who were working, or had been working previously, at a Swiss University, either in social sciences and humanities (SSH) or in the life sciences (LS).

We selected our interviewees in order to cover a diverse range of the postdoc population, with regard to their gender, their disciplinary field and the position they occupied at the time of the interview. The only factor that we did not control for during the interview recruitment drive was nationality. However, reflecting the unequal levels of internationalisation among the different academic disciplines, the SSH postdocs we interviewed are more likely to be Swiss, whereas LS postdocs are more likely to have been internationally recruited (see Table 2). The semi-structured interviews were carried out from a life history or biographical perspective. In order to understand better their vocational aspirations and choices, their expectations and their representation of an academic career, we invited the interviewees to reconstruct their academic, employment and family trajectories. Because our main focus was the analysis of gender inequalities at the early stages of the academic career, we also asked questions about their personal experiences of gender relations at work, and about their vision of work–life balance now and in the future.

Three ways of leaving the academic career path: how gender shapes the leaky pipeline

In the following sub-sections, we will use biographical interview data on leavers to identify three distinct ideal-type models of the leaky pipeline. Among our seven interviewees who had left academic employment, we have chosen individual cases (Ragin and Becker, 1992; Passeron and Revel, 2005) that cover a relatively diverse panel of the ex-postdocs that we met during our study (in terms of age, social origin, family circumstances and nationality) in order to provide a global understanding of the way gender norms and practices can influence the nature of individual trajectories out of the academic career path.

As we will see through our case analysis, although almost all of our interviewees (men and women alike) mentioned the relative precariousness of an academic career at some point in the interview, the accounts provided by those who had left the academic career track were clearly shaped by their current family circumstances and by their gendered expectations for the future.

A 'female carer' account of leaving the academy: 'wait and see' regarding issues of work–life balance

In this sub-section we will present the cases of Maria and Jennifer.[2] At the time of the interview, Maria was working as a part-time secondary school teacher, whilst Jennifer was unemployed and thinking about training to be a Taï-chi instructor. Both of them justified their decision not to pursue an academic career with reference to the difficulties they experienced in finding the right 'balance' between their work commitment and their family duties during their postdoctoral years. In their narratives, the university and their families appear as equally 'greedy' – or demanding – institutions (Marry and Jonas, 2005). Their accounts of these difficulties echo those of a number of women who work outside the home in the Swiss context, particularly those with young children and a partner who is working full-time.[3]

Maria was one of our oldest interviewees (48 years old). She is Swiss and has two children, aged 15 and 12 years at the time of the interview. Maria funded her PhD studies in the life sciences through a paid assistantship. After her PhD graduation, she was employed for almost 15 years in a series of fixed-term research jobs at our target university. In 2010, she decided to leave academia in order to re-train as a secondary school teacher. She claimed that her family duties played a decisive role in this decision. She presented being married to an engineer who works full-time in Switzerland as a major obstacle to the pursuit of her own academic career, because it had reduced the range of geographical locations open to her in an increasingly competitive international academic labour market. The issue of geographical mobility and location had been a difficulty for Maria for a long time. Immediately after her PhD, she took up a postdoc position in the USA; however, because she did not want to be separated from her then-to-be husband for too long, she decided to come back to Switzerland after just 18 months. With hindsight, she believes that coming back 'too soon' compromised her chances of ever having a successful academic career, because she did not have enough time to exploit the data collected during her US stay. Thus, she failed to publish anything as first-named author during these crucial years after the award of the PhD. However, despite this relatively weak academic record, on her return to Switzerland, Maria was offered a relatively long – 5-year – postdoctoral engagement at our target university. It was during this time that she gave birth to her two children. In 2005, she reduced her working hours (to 80%), because the crèche opening hours did not fit in with her previous schedule and because her husband had started to work very long hours. She claimed that reducing her hours had almost no effect on her academic performance record. Even when she was working full-time, she claimed that she was not

able to build up the kind of portfolio she saw as necessary for getting a permanent academic position, since this involved commitment well beyond the limits of the official working week: 'If a women has a family', she said, 'it can take a large amount of her time, and then she may have not enough energy to dedicate to an academic career'. She believes that secondary school teaching will limit the (often implicit) demands for 'permanent availability' that she perceived in the academic context.

In a similar vein, Jennifer (34 years old, Swiss, with two children) also presented her decision to leave the academic career track as a consequence of tensions between her work and family commitments. After the award of a PhD in the social sciences at our target university, during which time she also had her two children, Jennifer obtained an SNSF mobility grant in order to complete a two-year postdoctoral course in Berlin. Her husband, who was already a manager with a private Swiss firm, did not want to compromise his own career prospects by moving abroad with her, even though the SNSF would have paid for the whole family to move to Germany with Jennifer, under its 'family friendly' gender-equality measures (Fassa and Kradolfer, 2013). This refusal to accompany Jennifer abroad was based on at least two major considerations. First, the husband was effectively the 'main breadwinner' of the family, with a good salary and promising career prospects, whereas not only was Jennifer's postdoctoral grant fixed-term, it also provided only minimal social security cover for herself or her family. Furthermore, the couple had already managed to secure places in a crèche for each of their young children (aged 1 and 3 years at the time) and this was considered to put them in an extremely privileged position, given the very limited childcare services generally available in Switzerland. In these circumstances, Jennifer decided to move to Berlin by herself, returning to Switzerland to visit her husband and children once a fortnight: 'I was already exhausted before I left [after finishing her PhD with two young children present in the home], but this situation, doing round-trips, totally finished me off', she said. After almost two years of commuting between her home and her host institution, she experienced what she describes as a 'burn out'. She was put on sick leave for several months because she was unable even to 'open [her] laptop' or 'get out of the bed' in the morning. Before she decided to resign from her postdoc in Berlin, a tenure track position was advertised in her field at her home university. According to Jennifer, this promising academic career opportunity came 'too late', because her post-doctoral experience had 'completely blunted [her] will to pursue an academic career'. Despite receiving support and encouragement from her colleagues, she did not apply for this tenure track position: she applied instead for a part-time (40%), fixed-term postdoc position at the same university. Even with these reduced hours, she found her workload too heavy to handle with, as she said, her 'two children and full-time husband'. She finally decided to quit this new position after just a few months. At the time of the interview, Jennifer was registered as unemployed and was thinking about training to become a Taï-chi instructor. She was genuinely enthusiastic about this potential move: 'I've been practising Taï-chi for years; I had never seen this activity from a professional point view; this was just something I really enjoyed doing'.

In both of these cases, it is interesting to note that work–life balance issues feature as central explanations for the decision to leave the academic career track, despite the fact that these women had accumulated several years of work experience in academic jobs. However, it is also important to note that both of them appeared to be committed to quite normative gender arrangements at home. Their stated preference for part-time and/or flexible jobs reflects the dominant normative expectations of mothers in the Swiss context (Giraud and Lucas, 2013) and also provides some compensation for the long working hours (and hence non-availability at home) of their respective husbands. Both declared that they were relatively satisfied with their succession of part-time post-docs positions, apart from the fact that their institution obviously expected them to be available to work beyond the limits of their formal employment contracts. In some cases (as for Jennifer), it

was understood that any overtime would be paid, although this was clearly not always the case. Both interviewees suggested that they would have been willing to continue working in the academy, albeit in 'research support services' rather than in a professorial capacity, had the opportunity to accommodate better their family and domestic commitments been available. The jobs they envisaged for the future offer surprisingly similar characteristics to the ones they had held for many years at our target university, but they do not involve so much ambiguity (and associated tricky negotiations) regarding the level of availability and performance that should/could be expected from part-time workers on fixed-term contracts.

As we will see below, the fact that academic institutions expect more than they are willing to recognise from their postdocs is also a recurrent theme in the interviews carried out with those male 'leavers' who were also living in quite conventional family arrangements.

A 'male breadwinner' account of leaving the academy: 'up or out' regarding issues of recognition and reward

The narratives of men who leave the academic labour market are often very different from those of their female counterparts. The two men we will study in this section (Miguel and Tobias), had been working outside academia for a number of years at the time of the interview. Miguel is a manager in a biomedical firm: Tobias is working for the Swiss federal administration in Bern. For both of them, the decision to leave the academy was motivated by the relatively poor employment conditions offered to PhD graduates in Swiss universities, in comparison to other sectors of the national labour market. Their narratives suggest that the decision to leave was related to a desire to maintain a normative masculine identity which they considered to the threatened by the conditions associated with the early stages of an academic career in the contemporary context.

Miguel, who was born in Latin America, came to Switzerland after two postdoctoral experiences in different European countries, mainly because his partner was already settled in Switzerland. At the time of the interview he was 30 years old, in a stable relationship with a Swiss female lawyer, with no children. He decided to quit the academic career path a year and a half after joining our target university. His decision was motivated by the fact that, over time, he came to realise that he '…didn't really like the job of group leader in academia that much: it's all about writing research proposals and managing budgets and research teams, not much about research, really'. From his point of view, the job required too much commitment considering the very limited medium-term career perspectives he could expect to receive in return: 'I didn't want to end up being over forty and still with a fixed term contract' he said. To him, the lack of career prospects in the Swiss academy is due to a demographic imbalance between the high number of PhDs and the limited number of permanent positions. This means that competition for permanent academic positions in his particular research field is very high. Given the limited career prospects and job security in the academy, Miguel started to think about looking for a job in industry during his first year in Switzerland.

Tobias tells a similar story about his decision to leave the academy after his first postdoc in North America. He is 35, Swiss, has one child and his partner was expecting a second baby at the time of the interview. After his PhD award in Switzerland, he spent two years, with his partner, as a postdoc at a prestigious university in the USA. When he came back to Switzerland, he continued to invest in his academic career, even though he did not have a formal position to return to immediately. He took on a temporary teaching-only position at his home university and published some articles with his former PhD supervisor. However, since the couple were planning to have a baby, he also applied for a managerial position with the Swiss federal administration. He got the job and his first child was born later that year. Although Tobias sometimes misses the intellectual stimulation of academic work, he doesn't have any regrets about his decision to leave the university. He

says that his current job provides him with a better salary and, above all, 'more stability'. This is important because Tobias is the main earner in his household; his partner works as a self-employed designer, with an irregular income.

It is interesting to note that work–life balance issues are mentioned in both of these interviews, but they are addressed from a very different perspective to the one developed by Maria and Jennifer. For example, Miguel believes that one of the main disadvantages of being an academic is the fact that work tends to 'spill over' to other areas of life. However, unlike his female counterparts, Miguel was not concerned about the implications of this overlap with regard to his work–life balance but, rather, with issues of symbolic recognition and material reward. He believes that academic institutions expect people to work more than their official employment contract requires, whilst being unable to provide the necessary compensations to ensure lasting commitment and loyalty from their staff. Indeed, neither Miguel nor Tobias had any problem with the idea of working long hours; both of them agreed that 'being flexible' is vital to success in any field. What really matters to them is not how they will manage their family lives in conjunction to their 'elastic' (i.e. infinitely extendable) working hours (this theme rarely comes up in the course of the interviews, except in reference to their partners), but rather how they will meet the normative expectations associated with university-educated men in the Swiss context. Their main concern was to avoid accumulating a series of (relatively) poorly paid, fixed-term academic contracts, with no guarantee of ever reaching a permanent academic position. In this case, the male interviewees' (projected) role as main breadwinner played a major part in rendering the academic career path ultimately unattractive, in comparison to the alternative career opportunities on offer in the relatively buoyant Swiss labour market. On the very rare occasions when work–life balance issues were mentioned by this category of male leavers, they referred exclusively to the personal leisure activities that they had had been able to take up again once they had been relieved of the pressures and uncertainties associated with the academic career track.

It could be argued that, particularly when they are involved in family configurations that conform to the dominant Swiss gender regime, men and women leavers identify the same features of academic employment as the main source of their discontent. Not only are universities seen as greedy (i.e. demanding) institutions, they are also seen as being increasingly and structurally ungrateful to those in the early stages of an academic career. However, this shared diagnosis does not mean that men and women leave the academic career track for the same reasons. At the risk of over-simplification, we could say that the women leavers we interviewed, who were married, with children and living in households where they were expected to bear the brunt of domestic labour, tend to leave the academy in order to escape from the greediness of the institution. They moved into jobs where the amount of time they are expected to invest in their work was equivalent to their official working hours, with little regard for the stability, prestige or career prospects associated with their alternative occupational choices. In contrast, the male leavers we interviewed, who were also married and living in households where they were expected to conform to the normative masculine figure of the main (or sole) breadwinner, tended to leave the academy in search of gratitude (in the form of symbolic recognition and material rewards), with no concern for reducing the amount of time commitment or flexible availability they had previously shown to their academic employer.

A 'gender egalitarian' account of leaving the academy: when the price of staying is considered too high

Although we do not intend to develop this ideal-type in as much detail as the previous ones, it is interesting to note that the decision to leave the academic career track does not only concern men

and women who are living (or aspiring to live) according to the dominant Swiss gender regime. We can also cite the example of one male postdoc – Simon – who rejected the idea of pursuing an academic career precisely because this would imply the need for him to adopt a typically male breadwinner form of investment in his career, to the detriment of his active involvement in his home and family life and to the detriment of his partner's own professional career.[4] At the time of the interview, Simon, who is Swiss, was aged 35 and was living with a partner and her two children (aged 9 and 15 years) from a previous relationship. He was working as a part-time lecturer (40% contract) at the target university, but was also working part-time (60%) for an international organisation located in the French-speaking part of Switzerland. In a similar vein to Miguel and Tobias, Simon mentioned the psychological stress he was then experiencing, due to the uncertainty of ever being able to get a stable position within the Swiss academy. However, in the course of the interview, it became clear that his aspirations for stability were not framed in accordance with the dominant gender regime to which the other male interviewees referred. On the contrary, Simon explained that in order to have any chance of continuing along (and ultimately up) the academic career path, he should then be thinking of applying for another postdoc mobility grant. In fact, in his field of research, he would probably need to move to several locations across the globe over the coming years, in order to gain experience and build up his academic networks. The obligation to be internationally mobile that he sees as a prerequisite for a successful academic career in Switzerland is very problematic for Simon. Not only are the potential rewards for this mobility too uncertain or distant, this requirement also rests on a particular vision of the 'ideal academic' with which he finds it hard to identify: 'People are not trees that one can transplant from one place to another too often', he says. 'They have friends, family, or other ties (…) to the place where they live.' He refuses to accept the idea of leaving his partner and stepchildren behind in order to satisfy this 'sociologically unrealistic' demand to be more or less permanently on the move, whilst also stressing that taking them with him would require his partner to sacrifice her own career prospects, which in the first place he would not find ethically acceptable and which, second, would also be totally unreasonable, given the 'pie in the sky' (that is, very unlikely) chances of him ever getting a permanent academic job in Switzerland anyway.

Conclusions

In this article we have attempted to approach the leaky pipeline question from a new angle. We argue that the partial erosion of the traditional academic career path is particularly relevant to the leaky pipeline debate. As noted in previous studies on the Swiss academic labour market (Studer, 2012), early-stage academic jobs appear to be far more precarious and unpredictable than those available in many other sectors of the Swiss labour market. The widespread development of intermediary, fixed-term, often part-time, research and teaching positions in Swiss universities has undoubtedly modified the gendered logics that underpinned the decisions of male and female postdocs in the past either to remain in the academic career pipeline or to quit in favour of alternative employment opportunities. We have shown that, in the Swiss context, the aspirations of postdocs to remain in academic employment or to look for non-academic jobs are directly related to their position within the domestic division of labour and to their combined employment and family-care aspirations. However, this does not imply that a clear divide exists between work-committed men who stay and succeed in the academy and care-committed women who leave and 'leak'.

Our research shows that men may decide to leave the academic career path during their postdoc phase for very contrasting reasons. On the one hand, we have identified the case of those men who are strongly committed to a traditional 'main breadwinner' model of masculinity. As illustrated here by the cases of Miguel and Tobias, they adhere to a very clear 'up or out' logic of behaviour.

When faced with the impossibility of achieving a relatively stable and comfortably paid position within an acceptable period of time after their PhD submission, this first group of men will leave the academy in search of more rewarding career opportunities in other fields, without any consideration of the implications of this decision for their investment in their home and family life. They may occasionally return to academic jobs in the future, but only if these jobs are stable and well paid enough to support the 'modified male breadwinner' model of family life that they have become accustomed to.

A second type of male leaver shares the aspirations and practices of many of the female postdocs we interviewed. As in the case of Simon, they are not without ambition and commitment to their jobs, but they believe that the pressures that now weigh on young researchers, notably in terms of academic productivity and international mobility, are not compatible with a balanced and healthy personal life. Just like some of their female counterparts, they drop out of an academic career not because they lack ambition and drive but simply because they believe that the potential returns on the sacrifices they are expected to make in pursuing an academic career (Currie et al., 2000) are too costly for their own health or for the well-being of their loved-ones. Unlike the first group of men, the family aspirations and practices of this second type of male leavers tend to be more egalitarian, with as much consideration being given to the professional success and material comfort of the partner as to the postdocs' own career advancement. These egalitarian objectives are generally seen as more difficult to reach in academic institutions than in other sectors of the labour market (Glass et al., 2013).

Finally, we have been able to identify a third group of leavers, composed exclusively of women who – by choice or circumstance – adhere to a relatively normative model of femininity. In fact, it would probably be more appropriate to talk here about 'stayers' than 'leavers', although, as in the case of Maria and Jennifer, they may end up leaving academic employment. These are women, usually living with men who have already achieved main breadwinner status, who are able to accept a series of precarious, usually part-time, postdoc positions that are organised in such a way as to preclude any progression to full professorial status. Contrary to the first group of male leavers, these women adopt a wait and see attitude to their academic careers. Not only does the unequal share of domestic labour at home make in objectively difficult for them to conform to the normative expectations of the geographically mobile, highly committed, very productive postdoc, their family circumstances also reduce the imperative for them to develop strong, upwardly mobile career aspirations for themselves, be it inside or outside the academy. They are generally forced to leave their prolonged postdoc status solely by the employment rules of the target university which prevent them from working for more the five consecutive years on each of the fixed-term, non tenure-track teaching or research positions they have been offered. Unlike the egalitarian type, when these women leave the academy (often up to 10 or 15 years after they were awarded their PhD) they frequently undertake some form of retraining, and continue to work part-time or episodically in areas that are far removed from their research expertise, whilst devoting more time to their home and family. Here, we would seem to have the makings of a new (highly feminised) 'academic proletariat', which has been able to develop quite considerably in recent years, precisely because of its conformity to the normative 'gender scripts' (Le Feuvre and Lapeyre, 2005) or 'master status' (Krüger and Levy, 2001) that continue to influence all aspects of Swiss society.

We argue, therefore, that the gender significance of the leaky pipeline is potentially diverse and even contradictory. Whilst it is important to measure the relative chances of men and women becoming academic stayers or leavers, the implications of these attrition rates for their future progression to the most prestigious positions – in the academic hierarchy, but also in the non-academic labour market – are potentially diverse. More attention needs to be paid to the socio-economic environment into which the postdoc pipeline may leak. We suggest that the final destination of

male and female leavers may not necessarily be less attractive or rewarding than the uncertainty and precariousness they currently face within the increasingly greedy and structurally ungrateful or unrewarding higher education and research institutions.

Declaration of Conflicting Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Notes

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2. Pseudonyms are used throughout in order to preserve the anonymity of the interviewees.
3. http://www.bfs.admin.ch/bfs/portal/fr/index/regionen/thematische_karten/gleichstellungsatlas/vereinbarkeit_von_familie_und_erwerbsarbeit/traditionelles_buergerliches_modell.html.
4. We are not suggesting that this masculine model of exit is exclusively Swiss. For instance, among graduates from the prestigious French Grandes Écoles, some men choose to become secondary school teachers rather than university lecturers, in order to maintain their 'quality of life' (Bataille, 2014).

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Work–life interferences in the early stages of academic careers: The case of precarious researchers in Italy

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Abstract

This paper addresses the topic of work–life interferences in academic contexts. More specifically, it focuses on early career researchers in the Italian university system. The total availability required from those who work in the research sector is leading to significant transformations of the temporalities of work, especially among the new generation of researchers, whose condition is characterized by a higher degree of instability and uncertainty. Which are the experiences of the early career researchers in an academic context constituted by a growing competition for permanent positions and, as a consequence, by a greatly increased pressure? Which are the main gender differences? In what elements do Science, Technology, Engineering and Mathematics disciplines differ from Social Sciences and Humanities? The collected narratives reveal how the ongoing process of precarization is affecting both the everyday working activities and the private and family lives of early career researchers, with important consequences also on their future prospects.

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Introduction

Gender asymmetry in scientific settings has been the subject of a large body of literature. Numerous attempts have been made to explain this multi-dimensional phenomenon and to identify strategies with which to remedy it. Moving from different theoretical frameworks and approaches (sociology of work, organizational studies, feminist and gender studies, sociology of inequalities, etc.), several studies show that gender inequalities and discriminations emerge from the combination and interaction of factors which work at different levels: the cultural and political context at the systemic level (O'Connor et al., 2015); the academic and university discourse and practices at the organizational level (Gherardi and Poggio, 2007); and gender differences and stereotypes at the individual level (Husu, 2001). Our analysis focuses on the interaction of factors between the work and family life spheres that traverse all these levels (from policies, to organizational practices and symbolic order construction, to individual choices), and affect the career development of early stage researchers.

Two of the most explored factors are the management of care work and the division of roles within couples (Blackwell and Glover, 2008; Forster, 2001). Various studies have highlighted the negative impact of marriage, and especially of maternity, on women's career access and prospects in academic contexts, in contrast to men, who usually benefit from such family events (Ledin et al., 2007; Xie and Schauman, 2003). In fact, investment in life spheres other than work, such as family and caregiving, is seen, particularly by women, as a limitation on total dedication to the academic career (Lind, 2008; Preston, 2004).

The adoption of the neoliberal paradigm in the (Italian) university system implies, on the one hand, an increasingly higher level of competition and productivity that affects the work pace. On the other hand, the reduction of available resources and the trend to hire researchers with non-permanent contracts or tenure track positions accentuate the precariousness of the younger generation. These phenomena have major consequences in terms of everyday work–life organization and future planning of the two spheres, the professional and private. These phenomena entail, indeed, competition at the national and international levels and impose high mobility and hyper-productivity. At the same time, researchers – especially in the early career phases – are required to be simultaneously passionate, productive and competitive (Busso and Rivetti, 2014; Peroni et al., 2015). In an academic context characterized by growing competition for permanent positions and by a consequent greatly increased pressure, what are the experiences of the youngest generation of researchers? What are the main gender differences? In what respects do Science, Technology, Engineering and Mathematics (STEM) disciplines differ from Social Sciences and Humanities (SSH)?

Our analysis draws on the findings of a case study conducted in a university situated in Northern Italy. Attention is paid to the quality of working conditions of early career researchers and on how these affect their personal and family lives. After reconstructing the theoretical debate on work–life balance in academia, with particular attention to the case of non-tenured researchers, we will present the Italian academic context, which is characterized by a large-scale process of precarization of the early stages of careers. We will then discuss the context and the methodological tools adopted in our research, and the main aspects that emerged from interviews conducted with male and female postdoctoral fellows in a STEM and in a SSH department. More specifically, we will focus on: (i) the organization of work activities and its influence on private and family lives; (ii) the main difficulties related to the employment conditions and their consequences on future prospects; and (iii) the (lived or imagined) event of parenthood, focusing especially on gender differences. In the conclusions, policies for work–life balance in Italian universities will be discussed.

Work–life balance in academic work: the early career researchers' experience

Several studies have examined the obstacles in reconciling academic work and family duties, showing that in many cases the two spheres are perceived as incompatible by researchers. Women researchers, particularly, perceive the difficulties of managing work and family duties as a dilemma; and in many cases they resolve it by abandoning – or suspending – their careers, or alternatively deciding not to have a family (Blackwell and Glover, 2008; European Commission, 2012). On the one hand, in fact, a large number of women leave academic careers after marriage and the birth of children (Glover, 2001; Ledin et al., 2007; Xie and Schauman, 2003), or more generally because of difficulties in balancing work and family life (Forster, 2001; Hasse and Trentemøller, 2008; Preston, 2004). On the other, women scientists tend to marry less (Palomba and Menniti, 2001) and to have fewer children compared with male colleagues and women more generally (Blackwell and Glover, 2008). Furthermore, to a greater extent than men, women appear to feel frustrated and guilty over the difficult choices that academic work requires them to make (Sturges and Guest, 2006).

In recent years, the debate on work–life balance in academic careers has shifted its focus from the dimension of individual choice and investment to that of structural and organizational factors. On the one hand, in fact, opportunities to reconcile academic work and family responsibilities appear to be conditioned by the institutional setting and welfare regime of the country concerned (Le Feuvre, 2009, 2015). On the other, organizational practices and cultural norms are often modelled on the myths of total availability and the solitary hero (Beaufaÿs and Krais, 2005; Benschop and Brouns, 2003).

Universities are not gender neutral organizations (O'Connor et al., 2015). The structural barriers to gender equality in academia, phenomena of vertical and horizontal gender segregation, and women's exclusion from informal sources of power (Smith-Doerr, 2004) have to be understood in light of the masculine symbolic order dominant in the organizational culture of universities (Fotaki, 2013) and in the knowledge production narrative.

Academic work, indeed, is usually defined as utter devotion to science, and the scientist as a male worker without domestic or familial obligations totally committed to his work (Dean and Fleckenstein, 2007; European Commission, 2004, 2012). The prevalent idea of scientific work seems to be grounded on a "long hours culture" (Currie et al., 2000), constant availability (Ackers and Gill, 2005; Ward, 2000), and linearity of the career pathway (without any deviation or interruption).

This model is based on the gender stereotype which assumes that women must be involved mainly in the private sphere and in (unpaid) care-giving, while men work and deal with the public sphere.

The total availability required of those who work in the research sector is becoming increasingly aggressive and pervasive in contemporary academia. As evidenced by the growing literature on higher education, the impact of marketization, new public management, and neo-liberalism is becoming central to the experience of academics across the career spectrum (Bristow, 2012; O'Neill, 2014). The strict rules at the basis of university governance (e.g. high-ranking publications, assessment procedures, fundraising, etc.) have resulted in significant transformations of the temporalities of academic work (Jarvis and Pratt, 2006; Ylijoki and Mäntylä, 2003).

These transformations in the majority of the Western countries – and we will describe the specific Italian case – fit differently in the national and local contexts, which differ both in terms of gender, employment, and welfare regimes (Le Feuvre, 2015) and in terms of inequality of opportunity (gender and generation) in access to a promotion on the academic ladder.

This scenario of academia and research may play a particularly important role in the construction of the first stages of the career path especially among women researchers (Del Rio Carral and Fusulier, 2013; Müller, 2014), whose condition is characterized by a higher degree of instability and

uncertainty. In fact, the precarization of the labour market is marked by profound generation and gender differences (Vosko, 2009), and the academic labour market is no exception (Bagilhole and White, 2013). Moreover, the features that characterize academic settings in knowledge societies seem somewhat at odds with the possibility that especially non-tenure track researchers can devote time to their social, family and private lives (Fusulier and Del Rio Carral, 2012). Although in the past, too, there was a tendency for non-tenured researchers to delay parenthood until securing their first stable academic position (Blinn and Ryan, 1990), today it is even more pronounced given the current significant and multiple demands of proving competence in one's academic career to secure a tenure position (O'Laughlin and Bischoff, 2005).

In light of these trends, what is interesting in the experiences of early career researchers – as we will see in the empirical section of this paper – is the ambivalence that characterizes their narratives on academia. The work of a researcher is indeed characterized by an extreme individualization, with scant capacity for agency, but it is simultaneously an important source of freedom. On the one hand, young researchers are aware of the logics of the academic market (competitiveness, ongoing evaluation procedures, etc.), and they take an individual risk in order to develop their careers, or at least to maximize their chances of staying in the profession. However, on the other hand, they experience important degrees of autonomy, where research represents a 'labour of love' or an end in itself (Clarke et al., 2012; Worthington and Hodgson, 2005).

The ambivalent character of work in academia implies that pleasure and obligation become blurred. In many cases, early career researchers do not openly contrast the conflict between professional and private life and the increasingly precarious conditions. Indeed, the (supposed) unconditional passion for research – the "sacrificial ethos" (Gill, 2010) – often silences accounts of the personal costs of insecure and precarious work within universities.

At the early stages of a career within the university system, the difficulty of reconciling work and private life is cited as one of the main reasons for leaving academia. As an example, in a cross-national qualitative study conducted by Hasse and Trentemøller (2008) on academic physics, maternity leave appeared to be a 'push' factor to leave, especially for those on temporary contracts because they may lose contacts in academia or not be able to keep up. On the other hand, the greater pressures for an academic career coincide precisely with the phase of the possible formation of a family, in a context where women still often have primary responsibility for caregiving and housework (Fusulier and Nicole-Drancourt, 2015). Therefore, the rise of the neoliberal agenda and the increased competitive pressures in science tend to accentuate the difficulties encountered by women, confronting them with an exclusive option (Fuchs et al., 2001; Lind, 2008). Although young women scientists seem to have a lesser desire for children, recognizing that phenomenon does not gainsay that a growing number of female researchers would like to have children but cannot do so, both because of the intense day-to-day demands of contemporary academic employment, and because they are waiting for stable employment, but which sometimes comes too late, or may not come at all (Gill, 2010). Moreover, as stressed by several studies (Cummins, 2005; Nikunen, 2012), the possibility of motherhood is one of the things that make women awkward: "If they are mothers it is not easy for them to fit the demanded or expected norms; if they are not mothers, they still may not be recognized as fitting the norms" (Nikunen, 2012: 725).

In the following sections, after a description of the precarization of the Italian academic context, we shall describe the research design and methodology used, and then present the empirical material collected. Using a gender approach, we shall offer an interpretation of the particular experience of postdoctoral fellows, who have uncertain prospects regarding their professional stability in the future, and are often forced to sacrifice, or to postpone, achievement of a work-life conciliation that enables their self-fulfilment in spheres of life other than work.

The precarization of early-stage academic careers in Italy

Over the last ten years, the Italian academic system has undergone profound changes that have significantly re-drawn the overall chances of pursuing an academic career and heightened the level of competition among the new generation of researchers. The steady increase in the number of PhD graduates per year, which almost tripled between 1998 and 2013, has been accompanied by the systematic flexibilization of early career positions, and it has been only partially compensated by increased chances of obtaining a research position outside academia (Ballarino and Colombo, 2010; Martucci, 2011).[2]

The precarization of academic careers has gone hand in hand with the increasing level of restrictions imposed on the university system in order to reduce public expenditure. Since 2009, academic staff turnover has been limited by law (with a threshold of 50% for retired staff in recent years) (Donina et al., 2014). Moreover, in conjunction with the economic crisis, severe cuts to university public funding have been established by law. Such budget restrictions have in fact been imposed in an overall context where national research and development expenditure is considerably lower than the European average (Bozzon et al., 2015a; Martucci, 2011; Triventi, 2009).

The current composition of Italian academic staff reflects the consequences of these structural dynamics. Between 2008 and 2013 permanent positions (full professors, associate professors, and assistant professors) shrank by 14%, but they have not been fully replaced by new entrants or career advancements: the overall research academic research staff has reduced by 3% (Table 1). At the same time, there has been a substantial increase in temporary positions, all concentrated among early career researchers. In 2013, more than a quarter of research activities were carried out by fixed-term researchers (Table 1). The largest part of fixed-term research staff consists of postdoctoral fellows (85%; our target population), and their volume has increased by more than 34% in five years. Given the lack of women in top positions, the incidence of non-tenured researchers among women is higher than among men (respectively 32.9% and 22.2%).

The predominance of postdoctoral fellows among fixed-term research staff is an ambivalent finding. On the one hand, since these positions are usually financed by external funds, they reflect the capacity of each university to be involved in useful research networks and gather research funding, which is an indispensable feature of their scientific reputation. The incidence of these positions varies significantly by field of science according to the capacity to attract external funding, mainly from the European Commission and (to a lesser extent) from the private sector. In fact, in the case of "Engineering/architecture" and the "Natural sciences", in 2013 postdoctoral fellows accounted for respectively 34.4% and 25.4% of the overall research staff in each discipline, while their incidence was more limited in the SSH disciplines (14.1% in the Humanities and 13.5 in Social Sciences) (Table 2).

On the other hand, they are a paradigmatic example of the precarization not only of academic careers but also of high-qualified careers in the wider Italian labour market. Postdoctoral fellows represent a cheap way to counter the loss of human resources due to the rigid academic turnover rules, and to manage fundamental research activities by hiring highly specialized skills and competences, thus avoiding the constraints imposed by the centralized recruitment rules. Their recruitment is in fact controlled at departmental level.

Moreover, postdoctoral fellows are particularly vulnerable in terms of social protection, since they are not entitled to receive any unemployment benefit or other social security provisions or income support measures because they are considered to be "in training".[3] The lack of welfare support is often not compensated by higher wages; quite the opposite, postdoctoral fellows' positions in Italy are paid considerably less than the European average (Martucci, 2011). These disadvantageous job conditions, combined with the general lack of social supports and policies explicitly intended to promote gender equality – typical of the Italian familistic sub-protective welfare system underpinned by the persistence of traditional gender roles – are even worse for women than for

Table 1. Academic research staff: males (M) and females (F), Italy 2013.

	2008				2013				Var% 2008–2013		
	M	F	Tot	%F/Tot	M	F	Tot	%F/Tot	M	F	Tot
Permanent staff (a+b+c)	41,488	21,280	62,768	33.9	34,156	19,290	53,446	36.1	–17.7	–9.4	–14.9
Full professors (a)	15,364	3,565	18,929	18.8	10,955	2,935	13,890	21.1	–28.7	–17.7	–26.6
Associate professors (b)	12,080	6,176	18,256	33.8	10,278	5,532	15,810	35.0	–14.9	–10.4	–13.4
Assistant professors (c)	14,044	11,539	25,583	45.1	12,923	10,823	23,746	45.6	–8.0	–6.2	–7.2
Fixed-term staff											
Assistant professors	–	–	–	–	1,648	1,275	2,923	43.6			
Postdoctoral research fellows (postdoc)	5,929	6,161	12,090	51.0	8,097	8,183	16,280	50.3	36.6	32.8	34.7
Total	47,417	27,441	74,858	36.7	43,901	28,748	72,649	39.6	–7.4	4.8	–3.0
% Fixed-term assistant prof./total	–	–	–		3.8	4.4	4.0				
% Postdoc/total	12.5	22.5	16.2		18.4	28.5	22.4				

Table 2. Percentage of postdoctoral research fellows (postdoc) on overall research staff, mean age of postdocs, and % of women among postdocs and full professors by fields of study: males (M) and females (F), Italy 2013.

	Postdoc% on research staff[a]			Mean age			Femminization % of women among	
	M	F	Tot	M	F	Tot	Postdoc	Full prof.
Natural sciences	21.8	30.3	25.4	34.0	34.3	34.1	51.0	18.2
Medical science	8.9	35.9	19.5	35.4	35.2	35.3	72.0	13.9
Engineering/architecture	31.2	44.0	34.4	33.7	34.2	33.8	32.0	10.7
Agricultural science & Veterinary	10.2	18.7	13.5	35.4	34.9	35.1	57.3	16.1
Social sciences	10.2	18.7	13.5	34.1	33.9	34.0	53.7	20.7
Humanities	11.8	16.4	14.1	36.0	36.1	36.0	59.7	37.8
Total	18.4	28.4	22.4	34.4	34.8	34.6	50.3	21.5

Source: our elaboration on Ministero dell'Istuzione, dell'Università e delle Ricerca (MIUR) data, February 2015. (http://statistica.miur.it/default.aspx).
(a) Research staff is composed of full, associate and assistant professors, and postdoc.

men because they are at higher risk of remaining trapped in unstable and underqualified jobs (Bozzon et al., 2015b).

The difficulties of young researchers in giving continuity to their jobs (postdoctoral fellows' posts usually last one or two years, even if they are renewable for up to six) negatively affect also the chances of achieving expected research performances. This amplifies the effects of competition and uncertainty. Toscano et al. (2014) documented that most Italian precarious researchers believe that their insecure work position is hampering their work performance. Moreover, the lack of unemployment provisions seems to increase the need to find a new job before the current one expires, and this search overlaps with essential research and writing activities.

In this context, events in the private sphere that significantly redefine and/or increase the constraints in private everyday life (childbirth and couple mobility) usually reduce time dedicated to job activities (Falcinelli and Guglielmi, 2014; Petersen et al., 2012), and they may obstruct career development. This issue is particularly important if one considers that the mean age of Italian research fellows is 34.5 (Table 2) – which is a quite demanding phase of adult life in relation to not only the work sphere but also the private one – and the weakness of the Italian welfare system in helping (wo)men to balance work and family duties. The Italian welfare system – structured on the traditional "male breadwinner/women caregiver" model – is characterized by a general lack of family- and child-related policies and by persistent dependence on family (intergenerational) support/solidarity (Bozzon et al., 2015b; Ferrera, 2010; Saraceno et al., 2012). It offers low family benefits, long but often unpaid leaves, and limited public child- and elderly-care services. This is a rather hostile context for women who want to combine family responsibilities, motherhood and paid work. It has been documented that career instability experienced within a familistic sub-protective welfare system like the Italian one influences fertility behaviours, leading to postponement of (first) childbirth. This effect is particularly evident in the case of women with a high level of education and strong labour market attachment (Barbieri et al., 2015), which is the case of women involved in an academic career.

Research design

The following analysis is based on research conducted within the European project GARCIA – Gendering the Academy and Research: combating Career Instability and Asymmetries[4] focused on

Table 3. Interviewees by sex, department, position, and presence of children[6]

	Male	Female	Total
Science, Technology, Engineering and Mathematics Department			
Current postdoctoral research fellows (postdocs) with children	1	0	1
Current postdocs without children	2	3	5
Ex-postdocs with children	0	1	1
Ex-postdocs without children	6	4	10
Total	*9*	*8*	*17*
Social Sciences and Humanities Department			
Current Postdocs with children	2	0	2
Current Postdocs without children	2	2	4
Ex-Postdocs with children	0	3	3
Ex-Postdocs without children	2	5	7
Total	*6*	*10*	*16*
Total interviewees	**15**	**18**	**33**

gender differences in the early phases of the academic career increasingly characterized by precarious working conditions (Fusulier and Del Rio Carral, 2012; Ylijoki, 2010).

The analysis is based on 33 interviews carried out from September 2014 to March 2015 with postdoctoral fellows currently working, or who had worked in the recent past (from January 2010 to January 2014)[5], in two Italian university departments – one pertaining to STEM disciplines and the other to SSH ones – of a university situated in Northern Italy.

Our main aim was to determine the main difficulties faced by researchers at the early stages of the academic career. This was considered a phase crucial for understanding how universities can prevent the loss of talents and better support researchers' careers and working conditions. The research design adopted was particularly innovative, since we decided to interview female and male postdoctoral fellows currently employed in a STEM and a SSH department, as well as female and male PhD holders who had worked as postdoctoral fellows in the same departments in the recent past. By adopting this research design, we wanted to understand the main difficulties and reasons which may induce postdoctoral fellows to leave the academic/research system. Therefore, decisions on constructing a sample of early career researchers to be interviewed were directed by theoretical criteria. The "employment relationship" with the departments studied (current or ex postdoctoral fellows), "gender", and "parenthood status" were identified as key concepts for theoretical sampling. The approach adopted made it possible to track the interviewees' trajectories retrospectively by comparing the interviews conducted with PhD holders who – after a postdoctoral fellowship – had left the STEM or the SSH department with those conducted with postdoctoral fellows still working in those departments.

Table 3 shows the interviewees' main characteristics. To be noted is that, at the time of the interview, only seven of the 33 interviewees had children (three men and four women; four with Italian nationality and three foreigners). Moreover, it is significant that all the four women with children had left their departments on conclusion of their postdoctoral fellowship contracts. Instead, at the time of the interview, the three men with children had ongoing postdoctoral fellowships[5]. Finally, to be noted is that the average age of the interviewees was 36.7 years for the SSH department and 35.6 years for the STEM department. "Early career stages" are therefore often to be understood in relation to the academic hierarchy, rather than to the professional experience of researchers. In fact, the extremely high level of employment instability in academic settings has led, as already pointed

out elsewhere (Gill, 2010), to extending the designation of "early career" staff to the entire "career", given the few opportunities for development or secure employment.

The interviews lasted between 50 minutes and 2.5 hours and were entirely recorded and then transcribed. The material gathered was organized and coded using the Atlas.ti software program. A thematic analysis (Cassell and Symon, 2004) was conducted through identification of units of meaning, which were then grouped into categories and themes by an inductive process. At the same time, a deductive approach was also used by selecting a number of categories identified *a priori* in order to enable future comparisons among the other European universities involved in the research project.

The interviews explored two different temporal perspectives. The first was chronological. It related to *biographical life-lines and focused on past professional trajectories* and expectations about the future. The second one concerned everyday life. In this paper, particular attention is paid to everyday working life and work–life balance. More specifically, the following questions guided the analysis of the interviewees' perceptions: How does work affect the quality of personal and family life? How do work–life interferences affect job performance? We then concentrate on the gender differences and compare the perceptions of the interviewees at the STEM and SSH departments. In the next section we will focus on the main findings relative to the balance/conflict between working time and the time devoted to other life realms.

Precarious work–life balances: the paradox of the low level of conflict perception

As said, working in academic institutions and in the knowledge production sector has undergone major changes – new public management, marketization of knowledge and academia, and neoliberalism – that affect career opportunities, the way of doing research, and job contract in/stability for early stage researchers (Bristow, 2012; Gill, 2010; O'Neil, 2014). The consequences of the precarious conditions and the academic system's features affect the work and personal lives of male and female researchers at the early stage of their careers in various ways: in terms of mental and physical wellbeing, and in terms of the balance or integration of work and other spheres (Falcinelli and Guglielmi, 2014; Lynch and Ivancheva, 2015). In accordance with a large body of literature that adopts a gender perspective (Gill, 2010; Hasse and Tentemøller, 2008; Xie Shauman, 2003), the empirical material analysed in this study also confirms that the most problematic aspect of conciliation for those engaged in this kind of work concerns the choice of becoming a parent. In particular, for female researchers, the choice between motherhood and pursuit of an academic career proves to be the dilemma that more than any other highlights the reciprocal interference between the work sphere and the family sphere (Blackwell and Glover, 2008).

To deal with the work–life balance issue, we will first focus on the interviewees' perceptions of their abilities to organize the job schedule and workload, and on the role of work in their lives. We will then consider non-standard job conditions (economic instability and precariousness). Finally, we will examine job-related features in relation to the parenting choice, the maternity and paternity desire/experience.

Postdoctoral fellows' working activity and its influence on private and family life

Inspection of the interviewees' answers relative to workday organization shows that the majority of the respondents –from both the STEM and SSH departments – emphasized autonomy in terms of management of their time and activities. Indeed, the interviewees both from STEM – applied and engineering disciplines – and SSH departments did not have laboratory activities and usually

worked in small research groups. The researchers stated that they could freely decide where, when, and how long to work, according to the activities planned and their preferences and needs – "*it's up to you*". Nevertheless, we can observe that flexibility of the research activity was represented as an ambivalent feature. The encroachment of work on the private/personal sphere in terms of times and space – the so-called *domestication* phenomenon (Bologna and Fumagalli, 1997) – can lead both to greater freedom and a greater constraint on the effective capacity to manage everyday organization (Bellè et al., 2015).

> But I also worked at home, so I worked some times in the morning, I worked at weekends… so it was pretty flexible, but still I worked a fair amount and I was always there [at the workplace] on most days. Some days I worked at home maybe. (Ex-postdoc STEM, Woman, 34)

> I haven't got an office and I'm not too comfortable working at the desk in my open space… it's still a problem, because when you work in the office you can find a decompression zone in your home, while I mix work and private life at the same time. It's a constant mixing: the everyday life that is never such and the job crushes everything, because even in the evening when we're on the sofa I often send e-mails. I really never stop working. (Current postdoc SSH, Woman, 34)

Indeed, not having a fixed schedule often signifies adopting a "long hours' culture" (Currie et al., 2000), being available around the clock, and working during the evenings, weekends, days off, and holidays in order to meet deadlines, check and answer emails, and construct a competitive curriculum.

> The downside of working at university is that there are no fixed working hours. This makes people feel forced to work around the clock, without ever disconnecting. (Ex-postdoc STEM, Woman, 35)

> When I don't have to work during the weekends and the evenings this will be a novelty. (Current postdoc SSH, Man, 40)

The boundaries between work and other life spheres seem to be very weak, in an ambiguous exchange between work vocation and precariousness. Precarious conditions, in fact, have important consequences relative to the capacity to plan the professional career. The interviewees stated that in a postdoctoral position they have to work on the research for which they are paid; they need to publish in order to improve their curriculum vitae; and at the same time, they have to look for others posts, scholarships or research funds. This fragmented and demanding workload obviously had negative impacts on their personal lives.

Despite these working conditions, the interviewees very often considered them to be "intrinsic" characteristics of academic jobs – high competition, continuous performance evaluation, and high productivity levels. The "passion trap" (Murgia and Poggio, 2014) and the internalization of responsibility (Hawkins et al., 2014) are two mechanisms useful for understanding the weak and few complaints by the researchers and the acceptance of their job conditions that affect negatively their wellbeing and private/personal life.

> I have a balance, but it is insane: anyway, I work 60 hours a week, maybe more. I'm happy, I'm working very hard in this period, but I don't mind. (Current postdoc STEM, Man, 37)

> I work long hours, but in the end if someone wants to do research … […] either they do it because they have a passion or I think it's better not to do it. So when you do things because you like what you do then it's easy to work beyond the usual eight hours. So I don't know what the average amount is, but it's certainly nine or ten hours, and when there are deadlines even more. (Ex-postdoc STEM, Woman, 36)

Even for those who gave themselves rules to separate the spheres of life and work – for example, deciding not to work at weekends or in the evening – but waived their own rules in order to meet deadlines, this behaviour was considered to be normal (standard) and common sense.

> I do think I have a good balance, because my family doesn't complain much that I'm not there for them, or whatever. I try to play, I try to read, I try to do activities with my son and with my family in general. (Current postdoc STEM, Man, 36)

> I don't have fixed times. Indeed, there are periods of hyperactivity and other less frenetic ones. But I think this is common among fellows and graduate students […] the environment and the academic life in my group […] it is normal for pressures to be very strong. (Current postdoc SSH, Man, 31)

> R: Did you work during the evenings and at the weekends?

> I: Always. I worked at Easter, Christmas…it makes me laugh because it's like a collective disease in this environment. (Ex-postdoc SSH, Woman, 36)

The ambivalence of the narratives about academic work – the shared "sacrificial ethos" (Gill, 2010) – emerged from the words of all the researchers (men and women, STEM and SSH). At the same time, of particular interest is that the women researchers stressed more than their male colleagues their devotion to, and vocation for, academic work. According to Nikunen (2012), this may be interpreted as an introjection of the organization's requirement of a masculine work identity in order to assure high performances in the system.

Whilst it does not seem that the intensification and densification of work was perceived as particularly problematic by the postdoctoral fellows interviewed, a negative impact on the possibility of reconciling work and private life was instead exerted by geographical mobility, with some interesting gender differences (Ackers, 2010). More precisely, some women (mainly STEM researchers) explained that the frequent mobility periods (working abroad and participation in conferences), and the frequent changes of workplace in different cities or countries, were the main obstacles to the maintenance of private relationships. By contrast, stable relationships were more frequent in the stories of the men, even though they spent a large part of the week in a city different from that of the partner.

> Now I have to face a new change in my life and I am forced to leave my country and start all over again: new job, new friends, new everything. At thirty-six years old maybe I would prefer not to do so. If I had the chance I would be very happy to live here, but since I haven't had this chance…we'll leave and go to England. (Ex-postdoc STEM, Woman, 36)

> My life with my partner takes place in another city … We're a vertical part-time couple, and I have vertical part-time job […] I can't imagine in the distant future what will happen to the balance between my professional and private lives, because at the moment the way to have them coexist is to clearly separate cities and days of the week. (Current postdoc SSH, Man, 33)

In cases where the interviewees had long-distance relationships, they expressed explicit dissatisfaction with commuting and their 'split lives'. If permanent geographical mobility was part of their work in the case of period of visiting or conferences, it had a significant negative impact on the life of the couple and family planning choices.

Employment condition and its influence on future perspectives

In regard to employment conditions, the interviewees were mainly concerned about continuity in their life-span career development and access to social security. Their main common criticisms

concerned the duration of their precarious condition – "it's unfair to be considered an eternal intern" and the ambiguity of the work contract of postdoctoral fellows – "you don't have duties and rights". They stated that it should be recognized that postdoctoral fellows have jobs instead of scholarships. Although precariousness and economic instability were the main concerns reported by the majority of interviewees, in relation to construction of both their professional careers and private lives, it is possible to evidence some significant differences between the STEM and the SSH researchers[8].

First, the economic conditions of the STEM and SSH researchers differed in terms of salary. The STEM researchers earned between 2,000 and 2,500 euros per month, while those who worked in the SSH disciplines earned an average of 1,500 euros per month. In fact, the majority of the STEM respondents explained that the instability of their situation and the lack of guarantees were compensated by higher salaries in comparison, for example, with those of assistant professors (fixed by law in the public universities, differently from postdoctoral fellowships, which instead do not have a maximum salary).

> The salary is enough for me, I can also save a lot of money – nearly half of my salary – but it's a fixed-term contract and I'd prefer a permanent contract even if it meant losing half of my salary. (Current postdoc, STEM, Woman, 37)

Moreover, in the perception of STEM postdoctoral fellows, precariousness was a problematic issue only in relation to the academic context. Indeed, they did not perceive this problem in relation to their access to and stabilization in the wider labour market outside the universities – in particular in the private sector. Indeed, in the narratives of these interviewees (above all male) the private sector represented an opportunity to gain contracts and careers more stable and satisfactory than in the academic labour market, making it possible to plan private and professional life in the long term (Ferri et al., 2016).

> Obviously [the future prospects of researchers] are more than rosy and [...]. I think that in the future there will be a great deal of work, because technology is evolving rapidly, so that there will be a whole range of possible applications and problems to solve. I consequently think that there's a lot of chances. (STEM former postdoc, man, 36).

Instead, SSH researchers saw instability as the most stressful aspect of their jobs – even more than the heavy workload – and the level of their salary was a central issue during the interviews. Moreover, the SSH researchers also had a very different view of employment prospects outside academia. Their qualifications and experience in the labour market, in fact, did not provide certainty of employment. The former postdoctoral fellows in this research sector reported several difficulties in achieving a better position and job contract outside the academic context. Indeed, they experienced unemployment and the necessity to rethink their competences and professionalism according to labour market opportunities. The sense of insecurity and the risk of downward mobility were the predominant elements in their narratives (Ferri et al., 2016).

> I don't want to be pessimistic, but what I see is that there is less and less reliance on research, especially on the research that we do [...]. Then it must be said that our work as sociologists is not even appreciated. Here sociologists don't work as sociologists, but as politicians, bureaucrats, administrators … there's no investment in these roles, and with this mentality where do you think we'll go? (Ex postdoc SSH, Woman, 48)

> As soon as I don't have an international project to support me, I'll be unemployed, and at the age of forty, that's not the best experience that you want to have. (Current postdoc SSH, Man, 40)

> The main concern is stability for family choices and the fear that, if you don't have this stability, you're forced to follow a route that isn't the one that you aspired to – or maybe even worse – to follow an extremely low-skilled route where you don't find work because you're now thirty-five years old and even marketing agencies don't want you. (Current postdoc SSH, Man, 33)

In the analysis of contractual instability, therefore, what matters, at least at first sight is not so much gender differences as the differences between scientific disciplines – which continue to ensure ample employment advantages also outside academia – and the humanities, where instead the links between higher education and industry are still rather limited.

Precariousness and parenthood

If the element of the contractual instability pointed out the differences between STEM and SSH, the focus on parenthood projects, instead, highlights marked gender differences among the post-doctoral fellows' interviews. In fact, the impossibility of reconciling academic work and child care was emphasized by all the women interviewed, both STEM and SSH, both those who were mothers and those who would like to become one.

On the one hand, the majority of the interviewees considered maternity as an obstacle to an academic career. The women researchers – mainly SSH – who did not have children imagined work–life balance problems and the impossibility of maintaining the same work pace/intensity. Although both men and women (who were parents or otherwise) were aware that work affects the ability to take care of children, women reported higher levels of conflict between work and private/familial life in terms of everyday organization. This mechanism, which subsumes a traditional view of gender roles within the family, was even more evident among the women with children, who suffered more than their (few) male colleagues with children from worries that familial commitments could affect the work sphere, limiting their quality and productivity standards, as well as their career advancements. For women, in fact, the presence of children seems to exacerbate their feelings of guilt and inadequacy relative to their job performance (Sturges and Guest, 2006).

> Being a woman with a child is disabling. You can't think of studying and working like before. (Ex-postdoc SSH, Woman, 34)

> I think that until my daughter was six months old, I couldn't really work: I was in the workplace, sometimes I had to go to the kindergarten for breastfeeding and… the whole day was wrong and I don't know if I really worked. […] I don't feel really good. I don't feel that I work enough and that I work in the way I worked before. And I know it won't be like that anymore. (Ex-postdoc STEM, Woman, 29).

> With two children, it's absolutely impossible to keep up with all the things that the university requires you to do to get a steady job. There is no compatibility between the two spheres, so you have to make choices: either you focus on your career, and only do that, or you choose to have children, and so you have to look for other work. (Ex-postdoc SSH, Woman, 37)

Among women without children, there was an interesting difference between the STEM and SSH disciplines. In fact, whilst recorded at the STEM department were several stories by women who did not see the experience of motherhood in their futures – some because they did not want it, others because they thought it irreconcilable with academic work – more common at the SSH department were stories by women who delayed having children in the hope of attaining a higher level of job security in the future.

> Other people's children are nice, but I think maternity is really not in my nature, and I'm also an engineer… it's intrinsic. I don't have this predisposition, really. (Ex- postdoc STEM, Woman, 36)

> I don't want children, both because it isn't my main desire and because I believe that it would be difficult to work if I had a child, at least initially, because there are some very challenging periods. It's fine with me to work long hours for three weeks, always eating out, but how could I do that with a family? I don't think it would be at all compatible with the work that I do. (Current postdoc STEM, Woman, 37)

> My academic work is the obstacle to motherhood. My lack of a steady job prevents me from constructing a long-term project involving the care of a third person. (Current postdoc SSH, Woman, 34)

Job precariousness was the factor also cited by men with reference to the choice of parenthood. At the same time, men were less concerned than women about parenthood. They saw it as feasible; some of them considered the need to rethink work time organization but did not contemplate a possible decrease in their productivity.

> R: Are you thinking of having children?

> I: Yes. But I don't have a steady job: I don't know where I will be in four or five months. Not knowing if I'll still be here makes it more difficult. If I were stable here and she [the partner] was stable there, we could accept the fact, and we would get on with it […] but I think I should at least know where I'll be for the next months and where I'll be for the next years. At the moment I don't know, and this affects my plans. (Current postdoc, STEM, Man, 37)

> The management of not necessarily voluntary non-paternity is an aspect of conciliation failure. It is clear that contractual instability, or the lack of medium- or long-term prospects, have negative effects on life projects like starting a family or having children. (Current postdoc SSH, Man, 31)

> Perhaps more so because the scientific coordinator is a woman and has three children. But the fact itself that a woman with three children can become a scientific coordinator bears out the aspirations of all those who want to lead a life of research and, potentially, have children without repercussions. (Current postdoc SSH, Man, 33)

Hence, whilst also fatherhood is experienced as a critical event, in particular as regards job precariousness and the consequent discontinuity of income, the stories of the men interviewed reflected what has already been widely evidenced in the literature on this topic: the particularly marked difficulties for women who want to pursue academic careers and also have children.

Discussion

This paper has sought to show some of the main implications of the changes ongoing in early research careers, doing so within the wider context of the redefinition of scientific and academic organizations. In particular, the focus has been on experiences of work as a postdoctoral fellow, and on its interweaving with personal and family life. It should be pointed out that the context is Italy, which has some specificities in terms of both research and welfare policies.

The analysis was conducted along three main dimensions. We first considered the implications of the changes taking place in the management of time and flexible work organization and their impacts on the interviewees' private and family lives. Although the interviewees' certainly placed positive value on flexibility and autonomy in the management of time, and stressed the passion for the work that they did, apparent in their testimonies was the great difficulty of maintaining

boundaries and achieving a satisfactory balance among the various spheres of life. The rise of an increasingly intensive and extensive model of work seemed to require the young researchers interviewed to be entirely dedicated to their work – a dimension even more strongly emphasized in the interviews with women.

The second dimension analysed concerned the employment precarization of early career researchers due to the instability of contracts, the lack of social security, and unclear prospects of career development. In this regard, we found a number of differences between the STEM and SSH researchers related mainly to the more favourable economic treatment of the former. In general, however, these conditions, added to which is the increasing pressure (in terms of need and also opportunity) for geographical mobility, heavily affected the ability of the interviewees to plan for their futures and to achieve a stable balance in other life-spheres.

In particular – and this brings us to the third dimension considered – the possibility of starting a family, creating stable couple relationships, and even more, of having children, appeared severely penalized. This applied especially to the female interviewees, the large majority of who considered motherhood to be a major obstacle against (and often incompatible with) an academic career, and vice versa, especially in a context of insecurity and increasing pressures for performativity and productivity.

In concluding this paper, we believe it may be useful to offer some thoughts on possible strategies for change.

A first consideration is more specifically addressed to the Italian context, where it seems increasingly necessary and urgent to propose a redefinition of the classification of the contracts for early career researchers, so that they can be recognized as workers in all respects. Also as a result of the wider changes that have characterized the university system and the research sector, these positions are increasingly subject to pressures linked to productivity, and their skills are increasingly put in value, often invisibly, in the context of activities and projects designed to recover funding that universities are no longer able to ensure. In this context, their status as "non-workers" does not allow access to the (however meagre) welfare and security measures currently available for other professionals employed on temporary contracts. And, as we have seen, this certainly has significant consequences in terms of opportunities for reconciliation of work and private and family life.

The second consideration has a broader scope and concerns the need to highlight the implications that current patterns of access to academic careers and the "long hours culture" have on the quality of life of early career researchers in different countries.

It is necessary to find not only interpretive categories, but also organizational solutions that go beyond the traditional view of a trade-off between work and life, which often also implies a privatization of responsibilities and specific gender expectations. This can be done by starting from the awareness that in academic work the boundary between work and life is intrinsically and perhaps inevitably blurred, and is likely to become more and more so. In our view, therefore, the search for solutions should not so much aim for a chimeric perfect balance between spheres of experience considered as separate, but rather to grant full visibility and active citizenship to the work and everyday lives of women and men in research organizations. The younger generation of researchers, then, should not be seen as mere providers of labour, individual performers of publications, projects and lectures, flexibly fluctuating in time and space, but as whole subjects, with concrete biographical instances, engaged in complex relationships of work, affect, caring and leisure, and understandably eager to be able to plan a future, not necessarily in the academic world, but at least in line with the skills and qualifications obtained.

Declaration of Conflicting Interest

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Notes

1. This article is an entirely collaborative effort by the four authors, whose names appear in alphabetical order. If, however, for academic reasons individual responsibility is to be assigned, Rossella Bozzon wrote section 3, Annalisa Murgia wrote Introduction, part of section 2 and section 4; Barbara Poggio wrote part of section 2 and section 6, Elisa Rapetti wrote section 5.
2. The current academic recruitment process, established by the last university reform in 2010, foresees a progressive selection path lasting 12 years maximum after PhD graduation before entry into the first permanent position (associate professorship) and comprises 3 positions: (a) up to 4 years (now fixed at 6) as a postdoctoral research fellow; (b) up to 5 years as fixed-term assistant professor; and (c) followed by 3 years as a tenured assistant professor. At the end of the tenure track and after receiving the national scientific qualification which certifies the quality of his/her research work an assistant professor can be appointed to a permanent associate professorship (Peroni et al., 2015).
3. Only in the case of childbirth must mothers take a mandatory maternity leave of 5 months: the maternity benefit corresponds to 80% of the average monthly wage earned over the 12 months before the childbirth.
4. The GARCIA project has been financed for the period 2014–2017 within the call *Science in Society* of the FP7 Programme of the European Commission (Grant Agreement n. 611737) and involves seven European universities/research centres.
5. The interviewees that worked in the past in the two departments under study are indicated as Ex-postdocs STEM_dep and Ex-postdocs SHH_dep.
6. The partner's position is not included in the analysis because of the low number of interviewees with children. It would be interesting to develop a specific research design to investigate the relation between partners' occupation characteristics and the parenthood choice. Among the 5 interviewees of the Social Sciences and Humanities Department with children, 3 partners had a permanent contract, 1 a fixed-term contract, and 1 was a freelancer – not one worked in the academic context. Among the 2 interviewees of the Science, Technology, Engineering and Mathematics Department with children, the partners had fixed-term contracts; one of them worked in the academic context.
7. The interviewees at the Social Sciences and Humanities Department had Italian nationality except for three, who came from two different European counties. Instead, at the Science, Technology, Engineering and Mathematics Department, 9 people came from foreign countries – 1 from a European country and 8 from a non-European one. The data do not specify the Italian region of origin.
8. Nine *former postdocs* of the Science, Technology, Engineering and Mathematics (STEM) Department and six of the Social Sciences and Humanities (SSH) Department had continued their research careers at a different university or research centre (in Italy or a foreign country, in a public or private institution). Instead 2 ex-postdocs from STEM and 4 ex-postdocs from SSH worked in a sector unrelated to the research context (Ferri et al., 2016).

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"Navigating" through a scientific career: A question of private and professional configurational supports

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Abstract

Men and women remain in unequal positions in coping with their scientific and academic careers. Several of the mechanisms dissuading or preventing women from pursuing scientific careers have already been described in the literature: women getting stuck with paltry, undervalued tasks, thus manufacturing a "sticky floor"; structuring the scientific field around a masculine habitus; and the "Matilda" effect for women. An additional cause of these inequalities is observed in the relationship between the private and professional aspects of the individuals' lives. The university transmits a "gendered order" in its organizational structures, principles, customs and habits, in short in the practice of scientific work. That is due in particular to the ancient structuring of the university around a male figure: the "university professor" or "scientist" entirely invested in his work, freed from domestic necessities by an invisible carer (he or she who 'cares' for him), so he can devote himself to science. Hence the university was constructed on a "greedy" model expecting a total, voluntary and impassioned engagement in work, coupled with a model of work/ family dissociation. Based on a research programme dealing with post-doctoral researchers and recently tenured researchers*, this article analyses the role of their private life and how it relates to the professional sphere in their experience of scientific work. In this respect, it provides some explanatory elements on both the greater vulnerability of women-mothers in the university game

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*Translator's note: Unless specified, the term 'researchers' indicates both men and women.

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and on the configurational supports (configurations of professional life and private life) needed to offset that vulnerability.

Keywords
Scientific career, work/life balance, parenthood, university, sociology

Introduction

Reflections on the scientific and academic world go back a long way and are unceasingly renewed. Max Weber formulated the problem of the meaning of science for the person who has decided to make a profession of it.[1] Robert King Merton (1942) reflected on the question of the scientific ethos (revised in 1973) and Pierre Bourdieu (1976) enquired into the question of the scientific field and the production of a *Homo Academicus* (1984). At the same time, Bruno Latour and Steve Woolgar (1979) questioned the construction of science in the daily life of a laboratory. Yet, the sociology of scientists and scientific careers is an undeveloped research field (Prpic et al., 2014). Today as much as yesterday, having a career[2] as a researcher (or a teacher–researcher) presupposes a major temporal and subjective engagement involving integration in a social field, meaning a space of struggles for access to scientific recognition and positions valorized according to criteria and capital specific to that field, the definition of which represents stakes in a power game between the participants (Bourdieu, 1976).

Norms of commitment in the scientific field

From a functionalist type perspective, the professional socialization of researchers leads to the learning (acceptance and, quite often, reproduction), of an *ethos* resembling that of other highly qualified professions (Blair-Loy, 2003; Hochschild, 1997). This *ethos*, which requires demonstrating a vocation and total investment in a professional career (Beaufays and Krais, 2005; Dany et al., 2011), emanates from a *greedy institution* (Coser, 1974). Such an *ethos* appears in the accounts researchers offer of their work[3] and in the institutional documents wherein the universities express their expectations. An example from the Université Catholique de Louvain (Belgium) can be given in an internal note of its Rectoral Council dating from 2012 stating: "*from the professor completely invested* in his work and fully benefiting from his academic freedom, **we** *have moved on to a professor still entirely invested*, but much less free academically, given the increase in administrative duties and the numerous reforms which have followed in rapid succession [the authors' emphasis]". The university is thus a *greedy institution*[4] where the figure of the researcher responding to all of these solicitations, ignoring domestic concerns and attaining a stable post on a relatively tight schedule,[5] resembles a "*promotion script*" (Dany et al., 2011), a standard by which researchers compare themselves to one another in elaborating their professional perspectives. This has perhaps become even more the case in the last few years, since the deployment of new regulations governing scientific work (measuring productivity, a demand for rapid dissemination of research work, an injunction to co-operation, international mobility (Acker and Armenti, 2004; Ackers, 2010)), has increased competition on the job market and increasingly frequent precariousness in employment statuses (Ylijoki, 2010), exacerbating the researcher's "*accountability*" for his/her work, and all this generating a more entrepreneurial relationship to research (Lamy and Shinn, 2006). These cross-cutting norms in scientific work and organization have been observed throughout many cases of European

universities, although we need to point out that research organizations have their own particular contextual structures, local work and organizational cultures and career modalities, which in their turn are embedded in national gender and welfare regimes (Dubois-Shaik and Fusulier, 2016; Le Feuvre, 2015; Musselin, 2008). However, what has been observed is that the organizational specificities as we may observe them today in the specific Belgian university context, reinforce these scientific norms of a greedy institution: an increasing competition culture between French-speaking universities and within university units (faculties, research centres, and academics/researchers) due to selective and reduced internal and external funding; an increasing student body and decreasing teaching ratio for certain fields (human and social sciences); and a decreasing administrative support for teaching and research and more work load for academics/researchers (Dubois-Shaikand Fusulier, 2016).

University's organisation and gender inequalities

The university's functioning methods produce the sort of gender inequalities described in the expressions "*glass ceiling*" (redefined as "iron ceiling"; Fassa and Kradolfer, 2010) and "*leaky pipeline*" (e.g. Alper, 1993; Dubois-Shaik and Fusulier, 2015; Meulders et al., 2012; She Figures, 2013). The specific causes of these inequalities are less rooted in direct and explicit discrimination (notably in recruiting; Musselin and Pigeyre, 2008), as in the dynamics of: a *gendered organization* (Acker, 1990); resulting in a university management that resembles an *old boys' club* (Case and Richley, 2012: 14); and a Matilda effect (Fassa et al., 2012; Rossiter, 1993) penalizing women vis-à-vis their scientific productions, whereby their work is often attributed to their male colleagues enhanced by a closely related Matthew effect (Merton, 1968), which explains how eminent scientists will often get more credit than a comparatively unknown researcher, even if their work is shared or similar. Further, we encounter the injunction to give all priority to work over private life, with the researcher appearing as a "*lonely hero*" (Benschop and Brouns, 2003), entirely engaged in his work and thus supposedly released from domestic constraints by a *carer* (which expresses a certain model of work/family relationship according to a gendered order, see Crompton (1999) in particular; Fusulier and Nicole-Drancourt, 2015). In this respect, subsequently and in connection with other works (e.g. Case and Richley, 2013; Etzkowitz et al., 2000; Marryand Jonas, 2005; Perista and Perista, 2014), our research in Belgium shows that an additional cause of inequalities between the sexes is observed in the relationship between the private and professional, which we have described as a "hidden filter" (Fusulier and del Rio Carral, 2012).

According to a survey done in French-speaking Belgium, the relationship between profession and parentality is considered a dimension which discourages the pursuit of a scientific career for 50% of the female PhD students and 27% of the male PhD students (Meulders et al., 2012: 59). These proportions are far from being negligible for both sexes but massive as regards the women. More specifically, a study on postdoctoral research fellows (Fusulier and del Rio Carral, 2012) indicates, in a general manner, that 67% of the researchers believe that their professional life encroaches on their private and family life, a feeling present among 77% of the mothers. For 44% of the mothers, this feeling of encroachment also works in the other direction: an encroachment of the family life on the professional life, which is definitely less keenly felt in the other subgroups (fathers and childless researchers, around 25 %). It is not surprising that, for a little less than one mother out of two, "the conflict experienced between professional life and family life" represents a factor encouraging them to reorient their careers, with that opinion being shared by 29% of the childless women, 27% of the childless men and 23% of the fathers. Certainly, as we have seen, legal provisions exist to help parents reconcile their professional lives with their family

lives, such as vacations for parental reasons (maternity, paternity, parental, etc.). In any case, their use in the scientific field among postdoctoral researchers appears to create problems. Thus Fusulier and del Rio (2012) observed that only 80% of the mothers declared having used their entire maternity leaves (fifteen weeks) and 52% of the fathers their entire paternity leaves (ten days). Use of the parental leave is rather anecdotal. Recourse to those legal provisions is seen by the researchers as liable to have a negative impact on the possibility of having a career due to strong competition for the tenured positions. Indeed, 92% of the mothers, 79% of the childless women, 77% of the fathers and 75% of the childless men consider that taking a leave for private/family reasons or a career pause may have such a negative effect on their scientific career (Fusulier and del Rio Carral, 2012).

In fact, the university institution has been built on a model of work/family dissociation (Kanter, 1977) and fully espouses a gender regime assigning unequal places to men and women in distributing socially useful activities (Le Feuvre, 2015). Because they are historically defined as family heads (*pater familias*) whose presupposed qualities are self-assertion, technique, rationality and power, men are primarily assigned to the productive sphere and paid work. In contrast, women have historically been considered as sentimental beings whose excellent virtues within relationships of service are assigned to the family sphere and unpaid work. There are also stereotypes associating rationality with the masculine and the emotive sense with the feminine, further contributing to making "Science" a male activity.

Feminist claims and the gains of gender studies, which have denounced and deconstructed naturalists' arguments, have admittedly transformed the university institution. The university today proclaims itself to be both open to women and sensitive to the wishes of individuals to reconcile their professional lives with their family lives. One example of this institutional endeavour is to be found in the European Charter for Researchers, notably by appealing to workers and funding bodies to provide "working conditions which allow both women and men researchers to combine family and work, children and career".[6] But does this "good intention" of the institution translate itself into concrete practices which are observable in the experience of researchers today?

From our point of view, the university always encroaches upon the researchers' private lives through its particular ways of functioning and organization of work (greedy institution that requires total investment), through the particular types of evaluation and selection criteria (more productivity and quantity-based) and processes (numerous steps in non-transparent applications for few available positions). This type of organizing of the university fails to take into account (or very little) the marked differences, which remain between men and women in their investment in the domestic sphere. The presupposition of a total engagement in the career and institution is that the male or female researcher will adjust her/his private life to comply with this or benefits from a sufficiently strong support network within that private life to succeed in her/his career. That amounts to a masked and gendered expectation behind simple "scientific excellence", a pure genie, foreign to all ordinary considerations.

Research question

In this article, we seek to grasp the interaction between private life and the appreciation/development of scientific work/career. It is about understanding how early career researchers make sense of their engagement in a scientific career and the way this interferes with their life conditions, particularly in way of gendered differences. The postdoctoral phase of the scientific career has been identified in numerous ongoing studies as a particularly critical point, especially from a female point of view, as it involves a particularly precarious, unstable and vulnerable period for

work and private life and has been identified as a bottleneck in a leaky pipeline and interrelated phenomena (Dubois-Shaik and Fusulier, 2016). The jump to a tenured position therefore involves a host of configurations that allow this stabilization. In this perspective, we propose providing some elements of explanation both on the great vulnerability of women/mothers in the university game and on the configurational supports (configurations of professional and private life) needed to offset that vulnerability.

To do so, we will first describe four relationships to reconstruct scientific careers based on an analysis of interviews with researchers in postdoctoral situations. We will point out some "determinants" in these relationships, particularly in underlining the differences existing within the group of female postdoctoral researchers in terms of trajectories and material configurations of existence. Finally, we will turn our gaze to the "winning trajectories" of female researchers having recently earned tenure in French-speaking Belgian academic space: female research associates of the National Fund for Scientific Research in Belgium (FNRS).

Methods and analysis process

This article is based on a research project initiated in 2010 at the Université Catholique de Louvain involving researchers at early stages of their career (both male and female post-doctoral researchers and recently tenured researchers). This project combines qualitative interview and quantitative questionnaire approaches. However, this particular paper presents results that draw from the qualitative material and analysis. Our sample as well as the particular method of analysis of interviews, based on ideal-types, will be presented subsequently.

Sample

First of all, this research is based on an investigation targeting both male and female research fellows of the FNRS; it began at the University of Louvain in 2010 and benefited from FNRS financial support. Male and female PhD holding research fellows are chosen by the FNRS in a highly selective competition to carry out a research project over an initial three year period[7].

In the initial stage, in 2010–2011, an exploratory investigation was carried out by questionnaire. One hundred and eighty-four researchers belonging to all of the university's disciplinary fields (representative of a total population at that time of three hundred and five individuals) answered the questions dealing with their professional situation, the organization of their work, their work practices, their conception of professional engagement, as well as their private and family situation. Following that questionnaire, we met with eighteen researchers in the context of a semi-directed interview (seven men and eleven women).

In the second stage, an investigation by questionnaire was carried out during the 2011–2012 academic year among researchers in the first year of their research project mandate.[8] Among those individuals, thirty were contacted at random (fourteen women and sixteen men) in view of doing an interview every year during the three years of their post-doctoral mandate. Between December 2013 and January 2014, sixteen additional researchers in the third year of their mandate took part in this investigation (eleven women and five men).

Among the total number of interviews held between 2010 and 2014 ($N = 64$), thirty-two have been realized with parent researchers (18 mothers and 14 fathers).

In the context of this article, we supplemented that corpus with interviews carried out in late 2014 with sixteen female FNRS research associates, tenured between 2010 and 2014. In fact, they were done to control the information drawn from the first investigations with male and

female postdoctoral candidates in unstable professional situations by compiling the itineraries and experiences of female researchers having obtained a permanent mandate, whom we shall describe as having "winning" trajectories (in any case in reference to stabilization in the scientific domain). Out of ninety-two researchers tenured between 2010 and 2014, thirty are women (33%). Out of these thirty female researchers we interviewed sixteen[9] diversified according to their discipline (social and human sciences; sciences and technology; health sciences). The contacts were made at random. We would like to point out that permanent FNRS researchers constitute a specific body in the scientific field and Belgian academic body, comprising four-hundred researchers involving all disciplines (in human and social sciences: science and technology: and health sciences), for all French-speaking Belgian universities (every university has a quota, which is assigned). They are selected on the basis of their scientific applications by an ad-hoc scientific commission, based on criteria coinciding with the idea of scientific excellence as it is defined today (academic pathway, quality of the research project, publication list, international mobility experiences, research funding obtained, recommendation letters, scientific awards, etc.). These researchers moreover, have to be supported by the university that will host them, whereby the latter also selects amidst the final short list established by the FNRS scientific commission. It is therefore a recognized thing in Belgium that the FNRS permanent researchers are those with the "entrance ticket" for a permanent academic position that is highest, at least on the level of the scientific profile; around twenty researchers are tenured annually, although their number has been reduced drastically since 2015 and 2016 depending on the limits of quotas, which imply that a mandate is opened or is free to be taken.

Analysis process

We have studied the experiences and trajectories of both male and female FNRS research fellows and the meaning of their professional positions. More precisely, based on interviews, we have sought to understand how these researchers entered academic research, which gratifications they consider they currently benefit from (resulting from their activity and employment status), what type of engagement they agree to in work and in their scientific field or, further, what types of relationship exist between their professional activity and private life (among which familial).

According to the perspective we adopt, the relationship to work develops not only in professional and social dynamics (Avril et al., 2010) but in family dynamics as well. The interviews are principally divided into sections that include: the entry into doctorate; and the relationship towards work and private life (including parenthood and couple life). Every interview was summarized to produce a "comprehensive summary" of several pages, which is a synthesis of the biographical experience and a dynamic vision of the pathway of the researchers, linking up with their socio-demographic characteristics. This method was to have a holistic vision of every researcher (case study), which is not often possible with a more classic thematic analysis. Finally, we have operated through a double process of identifying similarities as well as differences between the different cases (e.g. the place their professional engagement occupies in their private lives, their conjugal and parental situation, the way in which they perceive and organize the articulation between work and family life, their projects, etc.), in order to be able to identify different rapports to the career, defined as ideal-types in a Weberian perspective (Weber, 1922). By ideal-type, we refer to an intellectual reconstruction, reducing the complexity of information gathered in the interviews and creating a kind of designator (caricatural representation), which expresses a logic that was manifested in certain interviews, without however implying a group of particular persons in a classification

(we therefore do not measure the impact of types). In other words, some researchers can incarnate literally a particular ideal-type, whereas others could be partially fitting one and another ideal-type, and others again may be very far from one particular and closer to another. It is through a qualitative analysis of similarities and differences of narratives that we have constructed a typology. In order to create this we have first worked on the first 18 interviews collected between 2010 and2011, then juxtapositioned with two more waves of interviews in order to test and reinforce the typology. The researchers who incarnate most a particular ideal-type also give us information about the socio-demographic characteristics and life configurations, which have more or less tendency for a type of relationship towards the career.

Findings

Four types of career relationships among FNRS post-doctoral research fellows

The analysis of the interviews in a vertical manner, interview by interview, shows the existence of relationships towards the career, which can be very different. While comparing the interviews (horizontal analysis of the comprehensive summaries), we can deduce the following four types of relationships towards the career:

- research may be a priority in life leading to a relationship of *engagement* (and thus in exclusion of other activities) to the profession;

- research may appear *optimistically* as an activity compatible with other personal commitments (with the family, leisure, etc.);

- doing research may nourish a form of *ambivalenc*e because of the painfully experienced competition with private life it imposes;

- research may be lived in assuming a certain *distance* from the facts, particularly due to the uncertainty as to professional futures it leaves unresolved.

We insist that this typology does not pretend to be closed or exhaustive (despite a sample of interviews, which showed a saturation of information); it does however assemble some cardinal aspects, which allows us to better understand the experience of the scientific career. Depending on their professional pathway and life path, researchers can modify their rapport towards their career and approach other type(s). Certain researchers can literally incarnate a particular type, whereby the majority shows hybrid rapports towards the profession or the career. We have chosen to illustrate the types that are incarnated by female researchers quite distinctly; this illustration by women is done in order to remind ourselves that although the gender question is fundamental, we should prevent having a deterministic vision, which would associate in a mechanical way the sex with the relationship towards careers.

    Analysis of these types of relationships and their determinants has enabled us to grasp particular factors of differentiation among researchers, in turn providing us a better understanding of the inequalities in the access to academic careers between men and women, and between different groups of women too. If the women's group is significantly inferiorized in the field of scientific research as compared to the men's, it also presents an internal heterogeneity that is just as significant. After having briefly described differentiated relationships to careers, we will reconsider the factors enriching our understanding of the position of women in the scientific field.

Type 1: Engaged (illustrative case in Box 1)

Box 1. Illustrative case: Lyn, doctorate in sciences, in a long distance relationship, without children.

> Lyn is of Asian origin, she is in a long distance Relationship with a researcher, who is living abroad. Her current position of research fellow was not planned. After obtaining her PhD title in her home country, her project of doing a career in research became clearer. Her thesis permitted not only of acquiring skills, but also in attaining self-confidence. Lyn underlines the central role of a professor at university in the development of her career as a researcher. It is thanks to this support that she was able to apply to different scholarships from abroad, notably a first scholarship from the FNRS. The daily life of Lyn is structured around her professional life. Her apartment is close to university. She works generally from 8 o'clock to 19.30 in her research centre, including Saturdays. Only Sunday is dedicated to affairs of "private life". Her holidays are also steeped in professional activity, although to a lesser extent. Reading articles, answering to emails, etc. are part of the daily tasks that she practices also during periods of holidays. According to Lyn, this constitutes the normal work of the researcher, who has to be productive and respond rapidly to diverse demands. Her current mandate of research has a precise function in her life path: acquiring a maximum of skills and of recognition for obtaining tenure. The project of having a child occupies a secondary place for the moment. Lyn underlines the importance of being independent as a woman in order to live in a "relaxed" way. Marriage and maternity are considered as handicap, which penalizes the professional future. For Lyn, abandoning the scientific career like numerous women, in order to dedicate themselves to family life, represents a real "waste" for science. She concentrates on her professional objective, which in her view, will put her in a situation of good conditions to realize a family project in the future.

This first relationship to the profession consists in the researcher's strong investment in her/his work, on both temporal and subjective levels. Recognized as a life priority, research appears as a singular activity which cannot be done in a half-way manner and which presupposes private sacrifices (vis-à-vis family and friendships, etc.). Extra-professional activities are thus relegated to second place in the name of a "passion" for research, a research access, which is associated with the register of 'vocation'. For these researchers, professional success is tangible and the precariousness it involves appears onerous but unavoidable. That precariousness leads to an intense engagement aimed at "giving yourself every chance" and thus to being totally available for work, with that often happening in the context of a feeling of obligation. Flavie, a 30-year-old female researcher in psychology testifies, for example, to that relationship to work. Her daily life is entirely rhythmed by research, from Monday to Sunday, and only leaves room for a few odd moments of leisure. Thus the sport of climbing, which she loves and practices on Sunday midmornings is wedged in between research activities, before and after. She feels she needs to work on Sundays to finish up what she could not do during the week. The same applies to her "holiday" time, which she uses (at Christmas, for example) to write a research project or carry out activities calling for long periods of concentration, like drafting articles. This commitment to work is linked to a particular vision of scientific work: it is likened to a form of leisure. Flavie works the same way at the laboratory or at home, benefiting from the freedom of her activity to advance, whatever the circumstances (school holiday periods, weekends, etc.). For her, obtaining a stable post is a horizon, which cannot be limited by private life and spill over of work into daily life never appear as sacrifices. Single and childless, like other engaged female researchers, she moreover considers that parenthood is rather incompatible with a researcher's activity.

Type 2: Optimistic (illustrative case in Box 2)

Box 2. Illustrative case: Sybille, doctorate in sciences, married, three children.

> At 33, Sybille is a research fellow in sciences. She is in a couple, has three children between one and six years of age. This researcher lives her daily life in the conciliation between work and her family through a solid organization, which structures her activities and puts clear limits between the two life spheres (for example, she works highly concentrated and without stopping during the day, normally until six o'clock in the evening, but rarely works evenings or during the week-end). On the level of the family, the routine plays a key role in the managing of responsibilities as a parent, in household chores, which she explains she shares equally with her partner, who is employed as an informatics expert. The couple and the family are a source of subjective satisfaction. On the professional level, she is affiliated to a very recognized laboratory in her domain, which she tries to play out in order to avoid too much international mobility. The support of her laboratory head in the consolidation of her career is very important to her. Although she is extremely motivated by the enigma that science represents on a daily basis, Sybille recognizes that she is nonetheless preoccupied by her future, particularly the financial aspect in view of her familial responsibilities. However, she prefers not to think too much about it.

A second type of career relationship is characterized by attributing a similar value to scientific work, coupled with a high idea of research and its requirements. That activity is regarded as strongly competitive and demanding but also gratifying, because of the freedom and autonomy it provides. But unlike the engaged individuals who give total priority to professional life to the detriment of private life, these researchers develop similar expectations towards work and private life. This similarity is due to a consideration which singularly distinguishes them from the first group: scientific work is seen as an activity reconcilable with private life. Consequently, these researchers have no intention of relegating life outside of work, while at the same time they intend to attain a level of scientific production, regulated by the same standards as the *engaged* researchers. This is the sense of "*optimism*": the male or female researcher is as optimistic as to his/her ability to meet the demands of the academic milieu as about his/her chances of success with regard to his/her current investment (one which does not scrimp on his/her private life). Optimism thus means that familial involvement is not lived as a brake on involvement and professional productivity. On the contrary, the effect may be positive. For example, the presence of children appears as a career advantage because it ensures a structure, helps in avoiding bad habits and inducing greater efficiency. For example, this is the case of Mathilde, a 38-year-old female researcher, mother of two children who explains that she can count on her parents to take care of her children whenever she only gets home from work at 8 p.m., due to managing her laboratory "cultures" – which happens regularly. That is also the case of Christelle, 30 years old with one daughter, who benefits from the availability of her husband, a secondary school teacher. He takes care of their daughter every evening, thereby allowing Christelle to attend meetings at her laboratory or participate in the group life characterizing the end-of-day.

Type 3: Ambivalent (illustrative case in Box 3)

Box 3. Illustrative case: Sia, doctorate in human and social sciences, married, 1 child.

> In a couple since 15 years with a lecturer–researcher, Sia just had her first child at 40 years. She and her partner have constructed their career and their couple via international mobility. However, as much as this mobility stabilized the career of her partner, it did not serve well for that of Sia. Already in possession

(Continued)

Box 3. (Continued)

of two PhDs and with numerous postdoctoral experiences in prestigious universities abroad, she tried multiple international applications without succeeding in obtaining a stable position. Passionate about her research activity, she is today disappointed by the institutional system, which according to her is based on "political" decisions rather than the actual merit of the researchers. Moreover, she expresses a great frustration concerning the sacrifices that she had to undertake on the familial level, as she and her partner had to try to stabilize Sia in her professional sphere before having a child. She underwent very difficult periods on a personal level as much as on the conjugal level before obtaining the actual permanent mandate. However, she feels that she has given too much in the name of "scientific excellence" without having plucked the fruits of such a sacrifice. Since her return from her maternity leave, Sia is torn between the run of the scientific production and her family life, notably in her role as a mother. This researcher expresses the need of taking time to reflect about her own view of and positioning in the career, but also feels guilty of doing it, in face of the impact this has on scientific efficiency.

A third career relationship consists in the experience of *ambivalence*. This is the result of a frustrated desire to attach the same importance to work and to private life. Ambivalence comes from a similar incapacity "to do what needs to be done for work" and "to do what needs to be done for the family". These *ambivalent* researchers claim an ideal of investment in work similar to that of the *engaged* and the *optimists*. But that ideal is constrained by sacrifices which increase the cost of the scientific career on personal, social and family levels. Their interest in research suffers faced with these sacrifices and the demanding character of work, the precariousness of employment and the difficulty of planning a future into account. Blandine, a 32-year-old female researcher, is the perfect incarnation of this career relationship. Her husband is heavily invested in his career activity as an independent veterinary surgeon. He works a lot; evenings, weekends and 'on-call periods' prevent his being very flexible and involved in parental and domestic work from a temporal point of view. Blandine in turn takes full responsibility for family life: caring for children, dropping them off at daycare and school, preparing meals, etc.; these tasks are described by Blandine as routine and servile and she complains about seeing her husband benefiting from solely happy moments with her daughters. Beyond her husband's professional constraints, in her eyes that is due to his "not very modern" vision of family life: she should do everything – in the name of the children's needs and the primacy of her husband's career. Certainly he recognizes that Blandine does more. But, at the same time, he thinks that that's justified by the flexible character of Blandine's work. While he recognizes constraints inherent in his wife's activity, particularly involving international mobility, for the time being he refuses to entertain the possibility of Blandine's travelling abroad.

Type 4: Distant (illustrative case in Box 4)

Box 4. Illustrative case: Camille, married, without children.

Camille has lived as part of a couple for three years. She finds herself in research "by chance", whereby she never had thought about a scientific career; she "grasped" a given opportunity via her supervisor. Although she takes pleasure in doing research on a daily basis and loves her subject, Camille no longer wants to have a scientific career in view of the professional uncertainty in her discipline. This probable "abandoning" is not lived as a failure. She takes a positive view of her experience and her mandate as research fellow is viewed as very rich, notably because it has given her a lot of competences. She is however not entirely sure about leaving, before having other perspectives in view. In particular, she is passionate about the cultural sphere and the world of theatre. This is, according to her, the first time she

Box 4. (Continued)

is thinking about a professional reconversion and is doubtful about her future. This doubt was "stifled" for a long time by the urgency of finding research contracts, one after the other. Today, she has a critical view about the demands of research, of the contradiction between planning her research projects, and the contracts, which are temporary and short-term. Camille feels especially the dilemma of needing to choose between research and cultural and artistic activities, which she had to renounce in her daily life in order to succeed in professional obligations. This sacrifice is weighing increasingly upon her. Camille does not feel much supported by her environment in her scientific activity. Her mother, who is a teacher, confuses research activities with studies, and believes it is a student life. Her companion on the other hand, who travels a lot as an entrepreneur, does not understand the restrictions of Camille's profession in view of the great liberty she has concerning deadlines of research projects. The managing of links between work and private life is translated in a difficulty to set limits towards the professional activity in order for Camille to become dedicated to other activities. The stability in the family has become clearer: Camille and her partner have the project of buying a house in the district where they live. The desire of motherhood is also present.

A last type of career relationship consists in "*distanciation*". This means placing oneself at a distance (not always leading to a disinvestment) from the ordinary requirements of scientific work: competition; temporal availability; and uncertainty and precariousness. These researchers continue to play the game, to the extent they feel they can go along with it. But, unlike the earlier cases, the game seems to have lost its substance: the *illusio* which 'made the other researchers go' has been weakened (without disappearing). These researchers seem relieved in explaining their distanciation, insisting on their awareness of the selective process at work in their career and the narrowness of the door giving access to a stable post in the scientific world. The taste for research still remains (among all the researchers we met, only a small handful said they were no longer interested in their work), but it is relativized by the constraints weighing on how things are done and which dictate how the value of the male or female researcher is assessed. These constraints no longer make sense and the distanced researchers no longer tolerate relegating their private life to the service of professional life. At home research is deemed secondary compared to other projects, and the possibility of a professional reconversion is at the centre of their relation to the future, even if it remains hard to imagine, if only because of disciplinary specializations making competences hard to sell on the labour market.[10] This is how it is with Aude, formerly *engaged* and now become *distant*. While testifying to the intense pleasure she obtains in research activity, and of a deep respect for the FNRS institution (her only employer to date), Aude today takes her distance from work in concrete ways in her daily life (she dis-activates Thunderbird on weekends or stays away from the computer). Moved by a desire to make the most of her son, her distance also appears as a form of protective shield given her fears of not obtaining a tenured post in academic research. Consequently, she turns to the private sphere and refuses to look ahead – from a professional point of view. This distance seems all the more satisfactory as she has a research background that is just as attractive to public research as to private.

What are the "determinants" of these relationships?

Can we determine the factors favouring a certain type of career relationship? Thanks to a comparative analysis of the interviews, we have been able to distinguish out some significant factors, which, while again revealing gender inequalities, help us in thinking about the variations within the women's group.

Analysis of these differentiated relationships to careers, particularly the proportions of men and women in the four different relationships, allows us to grasp the role of gender in the differentiation of these researchers' trajectories. Thus, within our qualitative sample, if we find men and women among the *engaged* and *optimistic*, the *ambivalents* are exclusively women. There is clearly a difference in the way parenthood affects women and men in their work experience. While interference between the spheres of work and parenthood is observed among women *and* men, we do not observe it among men *as we do* among women. Like the women, the men estimate that their professional activity is limited by family life (a family life which increases the cost of access to a scientific career and transforms the meaning of engagement in work). But unlike the female researchers, that deterioration is not accompanied – in each case for the men we met – by fear of imposing a professional constraint on family life. Thus the interference impacts upon time but does not result in questioning the prospect of an academic career, at least on a subjective level. The men regret less not being more involved in parenthood than they do not being able to carry out their professional project or enjoy their leisure as they see fit. Thus a significant difference in the assessment of the costs of interference between work and family on the family entourage is revealed here between men and women. And, sometimes on the margins, even the most "*optimistic*" women voice feelings of guilt – even if attenuated – transforming their relationship to work. However, it is often that feeling which produces ambivalence and sometimes leads to *distanciation*. This observation corroborates Julie Jarty's who, on the subject of woman teachers, remarked that "guilt over 'time stolen' from the family or additional constraints imposed on the partner […] represents a female speciality" (Jarty, 2009), produced by the gendered nature of the allocation of responsibility for domestic life. In this regard, the case of researchers raises a factor which can further reinforce guilt feelings: flexibility and autonomy in the organization of work (Brannen, 2005; Negrey, 2012). These dimensions of the activity allow one to decide places and times of work. However, in a context of employment uncertainty, a weak temporal regulation of work by research laboratories and a social injunction for assumption of responsibility for domestic life by women (retranslated daily in employment relationships), flexibility and autonomy can actually increase women's risks of being exposed to complaints from the domestic sphere and thus possibly lead to a sort of tug-of-war. In other words, flexibility is an opportunity for many researchers who insist on a unique "privilege". But it can also lead to being straight away identified and/or identifying oneself with a *carer* figure who can, if need be, always be there at the right moment (Bessin and Gaudart, 2009). In sum, this specific point on work–family interference illustrates the well-known inequalities between men and women: gender and familial situation appear together as a "hidden filter" in the management of careers (Fusulier and Del Rio Carral, 2012), hidden by the consecrated criterion of "scientific excellence".

But there are significant variations between women

Beyond these now well-known observations on the inequalities between men and women in the academic field, our research shows that groups of women also have internal factors of differentiation.

Variations linked to trajectories. The *engaged* relationship is first of all to be observed among unmarried female researchers, or else cohabiting with a male or female researcher, or having prolonged experience in the academic field. This was Sarah's case, who when we met for the first time, lived alone and devoted the greater part of her time to her work. Engagement presupposes a *de facto* freedom of organization subject to no domestic constraints. These researchers all insist on the idea of research as "all-consuming", where the male or female researcher cannot "realistically" work 35 hours a week. The fact of not having children generally comes up while invoking the total

incompatibility of parenthood and research, at least as conceived and implemented by the female researcher.

The two relationships presenting high level engagement in work, excluding family life or compatible with family life (*engaged* and *optimistic*) are to be observed among researchers having known a rectilinear professional trajectory. Their access to a doctoral and post-doctoral research mandate came immediately after obtaining their Master's degree or thesis. In addition, these female researchers insist on significant events that sharpened their desire to work intensely in academic research. Indeed, besides their fast track insertion, distancing them from more risky experiences, these female researchers refer to what seem to us to be positive signals – emitted by the scientific circle: the publication of an article or book; recognition by their peers in the context of a talk or seminar invitations; obtaining a prestigious scholarship; etc. It is thus the conjunction of a favourable insertion into the academic field and significant events which is at the origin of their desire to give as much back as possible – in a professional environment which is well-known to be based on an ideal of intense professional engagement. That ideal conveys a masculine professional *ethos* (Beaufays and Krais, 2005; Dany et al., 2011; Zarca, 2006), valuing an over-investment in work accompanied, as we have observed in other activities, by a familial underinvestment (Lapeyre, 2004, 2008).

Variations related to material configurations of existence. Demonstrating an optimism leading to the same level of investment in work and family presupposes specific material conditions of existence. These parent-female researchers (with the sole exception of one researcher trying to have a child when interviewed) in fact present professional and family configurations providing favourable supports: the possibility of ensuring an assumption of shared responsibility for the children between the female researcher, the partner and the family entourage; use of collective services, a home near the work place; etc. This configuration allows them to ensure an extended presence at the work place, such as evenings, but also to cope with long absences for scientific stays abroad (see Mathilde's case above).

Beyond the partner's availability, it is his understanding that favours optimism: he can liberate the female researcher by dint of understanding of the kind of constraints the female researcher is caught up in. In this sense, the partner is truly a mobilizable resource in daily life in satisfying the requirements of the scientific milieu. More simply, these *optimistic* female researchers present a strong homogamy (sometimes endogamy). If the partner shares a professional activity based on similar operating rules, the female researcher can work evenings or weekends, at the same time as her partner.

These are precisely the material living conditions which are lacking among the *ambivalents*. This career relationship, which is only observed among the parents, is in fact based on the absence of an essential resource, even if, in theory, compensated for by the presence of other organizational resources: living far from the work place and caring for children, the partner's professional activity is not very compatible with the researcher's, the children's fragile health may require a prolonged presence at home (this is, for example, Blandine's case above). It may also result from isolation with respect to the family entourage. Consequently, family life weighs down on the practise of work: days are shortened and the family configuration is not amenable to resuming work at the end-of-day because the partner does not work evenings (or not at home), or because domestic chores are too weighty, etc. Those difficulties nourish a frustration which does not directly touch the pleasure taken in doing their work, which remains powerful, but rather the sense they attribute to their engagement. Whereas that sense may be solid and structuring, founded on indices of professional success and their sharing an *illusio* that the scientific field legitimizes the efforts expected of them, the arrival of a child in a context of scarce resources from the private viewpoint increases

the cost of access to a scientific career (cost in energy, frustration and guilt feelings at having to ask so much of one's entourage and of not measuring up to the demands of one's milieu). Activities that were not perceived as efforts before come to be seen as "*sacrifices*".

The weight of (professional and private) configurational supports in "winning" trajectories among women

As our analysis and stylization of relationships to scientific careers have been carried out with researchers in uncertain situations as to their professional futures, we cannot deduce an impact on access to permanent positions in the academic field. That encouraged us to widen the study among female FNRS researchers recently tenured (between 2010 and 2014). From a socio-demographic point of view, these female researchers have a rather homogeneous profile although some important differences exist. The great majority are Belgian (five are of foreign origin), are between 32 and 35 years of age upon being tenured (four were tenured after 40, including three working in health sciences[11] and one who, for conjugal reasons – her companion living in Belgium – left a permanent position in her country of origin for the FNRS mandate), come from prosperous or even affluent socio-cultural economic milieux (only one comes from what might be termed an unskilled milieu with a low socio-professional status[12]), and are living as couples with children (only one is unmarried without children, and 2 are couples without children). Among the thirteen mothers we met, four have sought to obtain a permanent mandate before deciding on the size of the family.

For most of them, the trajectory of their professional insertion has been fluid and dense: a Master's followed by a doctorate (often encouraged by their Master's thesis director) and then several years of doctoral experience with long stays abroad (generally in leading international research centres), except for one female researcher who pointed out her "special" side in not having "extensive experience abroad" (which she justifies by her work on a literary subject which does not really require it). Yet some of them spoke of having had professional difficulties linked to meagre periods during research mandates or doubts as to the real possibilities of pursuing a scientific career. However they all found persons of resource in their professional field, sometimes mentors, who supported and even stimulated them in their undertaking, providing them with opportunities for new encounters through their own networks. These mentors were generally men; only one female researcher indicated the gender of her female thesis director. Moreover, these female researchers do not consider themselves to have been victims of gender discrimination. Nevertheless several criticized academia as a milieu unfavourable to maternity because of its rules of productivity and competitiveness. One interviewee nevertheless pointed out that when she announced she was pregnant, one of her promoters stopped speaking to her. Another spoke of a "male stronghold" whose obstacles for women are "invisible" but nonetheless "real".

It must be acknowledged that their "winning" trajectories are marked on the professional side by internal supports belonging to the university where they were tenured (most of them have a post in the university where they did their Master's and doctorates but that is a classic phenomenon in Belgium), with significant moments, such as research results that have had major repercussions in the field or an award winning book published, etc., or else a meeting with a researcher with high scientific standing during a post-doctorate, or presence in a research centre where they felt valued and became "the driving force" of the research, to use the expression of one female researcher interviewed. Yet almost all of them at some time evoke "luck" in accounting for their professional success, implying that even with a lot going for them in the game nothing guaranteed their obtaining the result that being tenured represents.

As regards their private sphere, we see clearly that their parents' support (moral, practical and financial) is important. Thus Muriel says this about her parents: "they didn't have much in the way of resources" [although my father has a university degree] but they always pushed us, my brother and I". As we have underlined, the social origin of these female researchers indicates a certain relation of "connaturality" fostering the production of scientific knowledge. Several have pursued their studies and research in a discipline or domain in which at least one of their parents have a qualification (a father doctor for a female researcher in medicine or an engineer or geophysicist for others in sciences and technologies; or a mother novelist for a historian). Emeline for example remembers that at the origin of her "passion", at the age of nine she had asked about the movement of the stars and her father had explained to her why: the Earth turns.

Far from being reduced to parents, we observe that that support is present in a marked way in the 'couple' relationship. In fact Manon will do her post-doctorate at a prestigious university accompanied by her husband and their first child. The same applies to Adeline who, following a first candidature for qualification as an FNRS mandate, understands from her failure that she must do her post-doctorate abroad, which she will do overseas with her husband and children. Cassandra will do two years of residency at "Marie Curie Fellowship", which, according to her, will be an excellent moment spent with family. Even if the support does not necessarily result in a common temporary expatriation over the course of a doctoral thesis or in the context of a post-doctorate, the partner proves to be understanding and accepts a temporary separation. This is for example the case of Elise (mother of a child), of foreign origin, for whom international mobility is not only integrated into her family of origin but also accepted by her partner who is himself a university professor.

Nevertheless for certain female researchers, having a child before obtaining a definitive mandate was unthinkable. For Emeline married to an engineer, the "project of a child during the thesis and post-doctoral period was impossible for lack of time since it's a constant fight to stay on top". Monica says the same thing: "A child – of course I put it off. I had this lingering question on whether or not my CV was sufficiently dense, rich, whether it would suit the FNRS because you can only apply three times there". It is less a conjugal question than a desire to be available to achieve a professional goal that maternity would have impeded, in any case from their point of view.

If the mothers explicitly evoke the difficulties of reconciling work/family in a job where "the work is never finished", they also express the feeling that the arrival of a child was "healthy" for them and sometimes had a structuring effect in the sense that several associate their maternity with a greater effectiveness in their work. This obligation, not necessarily seen as a constraint, "if I have children, it's to take care of them" declares Cassandra, affords them a better definition of research time, in attempting to optimize it. However, this effectiveness is also linked to their spouse's support. This is particularly the case of Caroline who speaks about her greater effectiveness at work while stressing her husband's "strong support" and "his good situation" (stable employment with accommodating schedules), or of Dominique who also says that her "companion supports her completely, and [that] her five-year-old son does not suffer from the situation". In this respect, we find what we have called logic of parenthood/work reinforcement in the case of female postdoctoral researchers (Barbier and Fusulier, 2015), which has nonetheless sometimes been stressed more by the researcher fathers than by the mothers.

Thus analysis of the trajectories of these women, who were able obtain valued posts in Belgian scientific space, underlines the extent to which (professional and private) supportive configurations are of prime importance, to that extent alleviating the situations of ambivalence and distanciation referred to earlier. On the gender analysis level, a female partner's support for her husband or partner's career fits into the traditional gendered order. Without thereby transgressing that order, these women researchers testify here to the possibility they have, and have had, of making a place

for themselves in the academic field while also benefiting from such support, provided by their partner, a man. Cases of homogamy, hypogamy and hypergamy are observed. Thus it is impossible here to define one type of conjugal structure as being more propitious for the scientific careers of women in couples. On the other hand, we observe that the partner's employment intervenes in a rather decisive manner but according to varying modalities: thus, for one of the female researchers the fact that her husband is a doctor ensured a level of income freeing her from being overly worried as to whether her own wages could be stretched out over the post-doctoral period; another proposed the stability of her partner's employment which, although less remunerative and "prestigious" than hers, provided her serenity in relationship to her own career; another pointed to her partner's professional flexibility, enabling her to make a stay abroad with him. In any case, such remarks reinforce the interest of studying scientific careers from the angle of the positive (or negative) work/family interference.

Discussion and conclusion

It is a foregone conclusion that the university is largely feminized today in Europe: in 2010, the proportion of female students (55%) and graduates (59%) exceeded that of male students, and women currently represent 46% of all PhD graduates in the current 27 European Union countries (Le Feuvre, 2015; She Figures, 2013). Yet the fact remains that the "leaky pipeline", along with (vertical and horizontal) segregation, is observable as a result of interrelated phenomena (Dubois-Shaik and Fusulier, 2015).

We wanted to show here the extent to which interference between working life and private life was an important dimension not only in the development of relationships to the scientific career of postdoctoral researchers (*engaged*, *optimistic*, *ambivalent* and *distant*) but also of "winning" trajectories among female researchers having obtained a highly valued permanent position in academic space. The credo of Excellence in science, research and teaching (which also results in a policy supporting an increase in the number of doctoral and postdoctoral candidates) governing universities today exacerbates the pressure on young male and female researchers seeking a durable insertion in the profession and hence in the field. However, far from revealing a "lonely hero or heroine" (Benschop and Brouns, 2003) which our accounts of experiences in the scientific milieu might convey, our study underlines the importance of the configurational supports that researchers find (or do not find) both in their professional environment (a supportive promoter, access to a carrier network, a well published article, benevolent colleagues, etc.) and in their private milieu (few conjugal or family constraints, or strong support from parents and partner, easy access to services, living near the work place, etc.).

However, these two types of supports do not seem equally distributed among the sexes (as well as socially, although we have analysed that less here). Thus, an *ambivalent* relationship to their career is mainly expressed by young mothers who, as Marry and Jonas (2005) have already clearly shown, are caught up in a double culpability: having the feeling of not being a sufficiently good mother *or* researcher. For example, Manuella, a postdoctoral researcher, regrets not taking care of her child correctly (when, for example, she plays "*the wildcard of putting on a film for him*" to be able to work) while still not finishing all her work. Then, she says, "*it all turns into a race. […] and I think to myself, he must feel it too. As if he were a nuisance. Because I want to work. He's there. At some point this is going to affect him*".

But this ambivalence is also linked to deficient support configurations which may play themselves out in very concrete aspects of daily life, such as regularly going to pick up a child at the end of day-care because the husband is not available (or does not make himself available), in being subjected to the disapproving glances of colleagues who stay late at the laboratory, or in being subjected to the remarks of the day-care centre entourage and employees on the benefits of family time.

Nevertheless, women in science may find themselves at intersections of strong professional and family supports enabling them to assume, for example, maternity without living it as a career handicap. If their work availability ends up being reduced and difficulties in reconciliation are acknowledged, their effectiveness (at least in their discourses) increases. If analysis of the "winning" trajectories of women in science shows the importance of configurations throughout their scientific careers, we want to stress that these configurations are also observed in male trajectories, but unlike the women's, they appear more naturalized and thus less problematic.

Finally, this article confirms through new empirical material, a fact that has been much documented already in the literature, that it is always much more difficult for women than for men to undertake a scientific career, not because of a direct discrimination, but due to the perpetuation of a gendered societal order and a male-centric university organization. It shows an important indication that despite the discourses about equality between men and women, the institution provides little support for women researchers, who depend instead on support that they (on their own) to some respect find in their immediate working environment and especially in their private environment. We could presume that an ambitious gender policy in universities and research centres, with measures that favour parent researchers, could contribute in combating asymmetries in the scientific career between men and women. However, in the current context, the scientific institution has subscribed itself to new tools of evaluation, which reinforce a "short-term, accountability and productivity based regime", which equates the *good* to the *surplus*, in the sense that whatever is expected of a good researcher is always *more* publications, more projects, more funding obtained, more mobility, etc., in a lapse of time as short as possible (Fusulier, 2016). Thus, these tools, norms of scientific work and this regime accentuate the pressure upon researchers, which in consequence, potentially reinforces the tension between work–family. This goes against the intentions of acting favourably towards gender equality. There is therefore not only a questioning about organizational support measures that are required, about what universities can provide and set up, but also about the institutional regulation of the scientific space and its current call in the name of Excellence, always pointing towards more productivity, mobility, competition and accountability. Undoubtedly, it is necessary to think about an "alter-Excellence", which puts quality before quantity, supporting intellectual risk-taking and taking into account the rhythm of scientific production ("slow science"). Simultaneously, such an alternate Excellence would permit researchers to control in a more effective way their professional lives, to articulate in a more harmonious way their private lives, and thus favour a development of scientific careers that is more gender neutral. In addition to changing the "Excellence-based" norms, the university can also rethink what demands are needed for the different stages of the career, whether scientific hyper-production needs to govern the post-doctoral phase and whether this responds to the requirements of tenured scientific or academic positions that involve more varied tasks. Structures and programmes that assist early stage researchers and academics can easily be set up to create collaboration-based support for both work and career guidance within research units and among colleagues (Adam et al., 2016). Moreover, the high significance of funding structures and conditions is something that remains an invisible yet powerful source of gender inequalities (Finnborg et al., 2016). However, this debate takes us beyond the scope of this article.

Declaration of Conflicting Interest

Funding

Notes

1. See his conference, delivered in Munich in November 1917 and translated into French in 2005 (Weber, 2005).
2. That is, entering competition to obtain a permanent position and then participating in that scientific field in order to gradually accede to positions that are valorized in that field.
3. In France we find a recent example maintaining that image in the account rendered by a researcher of the National Centre for Scientific Research in Physics (Centre National de la Recherche Scientifique en physique) (Balibar, 2014). Sébastien Balibar presents an activity presupposing permanent availability and reactivity motivated by the search for scientific Truth.
4. This is the description in several research works (e.g. Currie et al., 2000; Hendrickson et al., 2011).
5. Grant et al. thus indicate "in addition to making claims for undivided loyalty, scientific careers in academia also have a normative clockwork, embodying expectations of the benchmarks that should be attained by specific points on a pre-determined timeline" (Grant et al., 2000: 65).
6. See http://ec.europa.eu/euraxess/pdf/brochure_rights/eur_21620_en-fr.pdf
7. This may be extended for one year under certain conditions; including in the case of the mandate's suspension due to another post-doctorate abroad.
8. Seventy-two questionnaires, filled out completely, were collected; out of a total of ninety-nine individuals in the first year we obtained data (forty-one women and thirty-one men).
9. We owe it to ourselves to respect anonymity and discretion regarding these individuals so that they cannot be identified, which sometimes leads us to being rather imprecise as to their professional or private situation.
10. For this reason, this logic of distanciation is that much more successfully lived if the researchers evince other centres of interests (family, leisure, a social or cultural engagement, etc.) and benefit from a marketing ability provided by a rare qualification (linked to a discipline more or less valorized on the labour market).
11. This involves women researchers who did their doctoral theses at a more advanced age (defended at around 35 years of age) after clinical or professional work experience connected to a first university qualification. Their entry into fundamental doctoral research thus represents a maturely considered choice to have a scientific career which would lead them to add a post-doctorate in positioning themselves in the race for obtaining a permanent position.
12. Her mother having raised her children alone, with unswerving dedication and in considering that everything was possible, Valentine does not want to prove her wrong. Today she is very proud of her career path, opened to her by one of her professors who had become a true mentor for her.

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