Occupational Gender Segregation in Germany

The role of occupational opportunities and constrains for gender differences in aspirations and employment trajectories

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1.1 Thematic Introduction

This dissertation project investigates how occupational contexts influence individual occupational decisions and subsequent employment trajectories. Occupational choices in adolescents are of central importance for the life course, with far-reaching consequences e.g. for wages, job quality, and status allocation (e.g. Busch 2013a; Blau and Kahn 2017; Stier and Yaish 2014; Solga and Konietzka 1999). Especially in Germany, where occupational mobility is rather low, the occupational choice of initial vocational education and training (VET) or field of study marks a decisive step in setting the course for one's future. Even though occupational knowledge tends to become outdated faster nowadays, the initially chosen occupation and the first job remain important for status allocation in later working life (Solga and Konietzka 1999).

Against this background, public and scientific discourses continuously address questions about determinants and consequences of gender-specific occupational choices, which on the macro-level result in occupational gender segregation. Women continue to be found mainly in occupational fields like teaching and care work, while men dominate occupations in science, technology, engineering, and mathematics (STEM). This occupational gender segregation remains a very persistent phenomenon, although all Western societies record extensive changes with regard to the gender system in the last decades (e.g. Charles and Grusky 2004). These changes are particularly observable with respect to increasing gender egalitarianism and the accompanying implementation of equality policies that aim to decrease disparities between men and women regarding labour market participation and related outcomes (e.g. European Union 2011).

Interestingly, especially in countries with developed welfare policies and a large public service sector, the higher levels of female labour force participation – especially for mothers – is accompanied by a high concentration of women in female-typical occupations and low female representation in managerial positions (Mandel and Semyonov 2006). Even if societal gender norms and related welfare policies are subject to substantial change and should lead to decreasing gender differences, occupational gender segregation remains stubbornly intact.

As occupational gender segregation is the result of a gendered career choice process which imply structural disadvantages for women (see e.g. Dämmrich and Blossfeld 2017 for holding supervisory positions; Stier and Yaish 2014 for job quality; Katrin Leuze and Strauss 2016 for wage inequality), it is important to investigate how occupational choices are constrained and how they affect gender disparities in later working life. Most existing research on gendered occupational choices focus on individual-level explanations e.g. cognitive and mental ability (e.g. Schoon and Polek 2011), the gendered socialization within the family context (e.g. Lawson, Crouter, and McHale 2015), on household characteristics (e.g. Bröckel, Busch-Heizmann, and Golsch 2015), on the organisational context (e.g. Buchmann and Charles 2016; Huffman, King, and Reichelt 2017) or on country-level influences such as gender norms that are accompanied by reinforcing social policies (e.g. Kathrin Leuze and Helbig 2015; Budig, Misra, and Boeckmann 2012; Grunow 2014). However, the overall occupational structure of (local) VET and labour markets or the internal structures of occupations are rarely the object of investigation, even though empirical studies indicate that both may affect employment trajectories[1].

The *overall occupational structure* – meaning the aggregate distribution of occupations within a particular context e.g. the national or local labour market – can be described based on classification schemes which group similar occupations together. It reflects e.g. the relevance of specific industries within the respective context and is prone to changes over time, e.g. due to technological innovations implying a demand for different qualifications. The *internal structure of an occupation* refers to the features and attributes of occupations with regard to e.g. gender composition, occupational hierarchy, skill structure, occupational closure or opportunities for promotion. Gender segregation is therefore one aspect of the internal structure of occupations. These internal structures can often be traced back to the developmental history of occupations, as it will be shown later on in an exemplary way.

Against this background, I examine how the overall structure of occupations within the local context and the internal structure of different types of occupations affect gendered occupational choices and its consequences. All three subprojects of this cumulative

[1] For occupational-level influences on the duration of family-related employment interruptions see e.g. Bächmann and Gatermann 2017 or Stuth, Allmendinger, and Hennig 2009; for occupational-level influences on temporary employment see Stuth 2017; for the affect of occupational sex segregation on part-time work see Blackwell 2001; and for holding a supervisory position see Dämmrich and Hans-Peter Blossfeld 2017. For the relevance of regional structures see e. g. Hillmert, Hartung, and Weßling 2017; Wicht and Nonnenmacher 2017 and Weßling, Hartung, and Hillmert 2015.

dissertation focus on the relevance of occupational opportunity structures (within and between occupations). The overall research question is:

In how far do opportunity structures for 1) the access to and 2) employment trajectories in gendered occupations affect occupational gender segregation and its consequences?

The subprojects contribute to answer this question by asking in particular: Whether and to what extend do opportunities and constraints in the local VET and labour market affect occupational aspirations of school leavers in Germany? Are boys and girls affected differently? (Paper 1) Do employment patterns differ between occupations with different gender composition – independent of gender? Are employment patterns of men in female-typical occupations more similar to those of women in female-typical occupations or to men in male-typical ones? (Paper 2) Do men demonstrate a comparative advantage regarding access to and staying in a leadership position? To what extend do gender-typical occupations differ in their opportunities for promotion? Do gender effects regarding upward occupational mobility vary across gender-typical occupations? (Paper 3)

By investigating how access opportunities for and subsequent trajectories in gendered occupations contribute to explaining social disparities, this dissertation builds on a long standing tradition of social research that defines occupations as institutions of social stratification (e.g. Hatt 1950; Daheim 1967; Beck, Brater, and Daheim 1980; Charles and Grusky 2004; Blackburn 2006). Furthermore, it is in line with recent trends in sociology and economics, which 1) investigate the relevance of overall occupational structures, e.g. at the regional level, for the transitions into the labour market (e.g. Hillmert, Hartung, and Weßling 2017; Wicht and Nonnenmacher 2017; Weßling, Hartung, and Hillmert 2015) and 2) further look at the internal structure of occupations as framework for specific employment trajectories (see e.g. Bächmann and Gatermann 2017; Stuth 2017; or Dämmrich and Blossfeld 2017). All three subprojects comprised in this dissertation focus on the case of Germany, where we observe strong gender segregation already in the VET system but also in the labour market and simultaneously low occupational mobility, particularly in comparison with the US (DiPrete 2002), but also in comparison with other European countries like Italy or Greece (Hillmert 2015). Thus, the development of gendered occupations in Germany is outlined in the following.

The Development of Gendered Occupations in Germany

The historical development of occupations is of significant importance for the understanding of the internal structure of an occupation, especially with respect to gender composition. Occupations dominated by men were often strongly affected by the process of industrialisation, in the course of which the emergence of modern labour markets led to an idealistic differentiation of two separate spheres: work as male sphere and private life as female sphere (Beck-Gernsheim 1976). In this context, specific occupations emerged as female niches, which contain tasks formally carried out by women within the household such as child rearing and elderly care (Krüger 2004). In line with the traditional family model of a male breadwinner and a female caregiver, West German policy[2] of the post-war period has been designed to reinforce a gendered division of labour in order to maximise the productivity of men in gainful employment while women are delegated to reproductive work. Being economically inactive was interpreted by and for married women as an expression of wealth and privilege so that female gainful employment was seen as to reflect a need to improve the household income. However, at the latest by the birth of the first child, women were expected to be exclusively devoted to household and family (e.g. Kolinsky 1989).

Because VET for and employment in female-typical occupations were meant to be just a bridge between the end of school and marriage (or motherhood), the VET for these occupations did not aim to prepare for labour market careers. The skills obtained during VET for female-typical occupations were supposed to prepare women for their later role within the household and at most qualify for a secondary employment to improve the household income. Consequently, VET for female-typical occupations was organised in the form of school-based training with much weaker labour market proximity than the male-dominated dual VET system (Krüger 2003).

The access to many male-typical occupations below tertiary level is gained by so called “dual training”, which is mainly firm-based training combined with general schooling. These highly standardised and occupation-specific apprenticeships are strongly connected to the labour market as employers and trade unions have considerable influence on the content and form of dual VET. In contrast, the school-based training for female-typical occupations has not been

[2]There are some German policy reforms since the 1990s, such as the child's right to a (half-day) kindergarten since 1993, the introduction of more flexible and more part-time parental leave since 2001, and the introduction of tax allowances for housekeepers and childcare since 2002. However, elements that promote the traditional breadwinner model still remain in the German system. These include e.g. the taxation of married couples (splitting the difference in spousal income) and part-time schools and kindergartens (Grunow, Aisenbrey, and Evertsson 2011).

standardised under collective bargaining law (Krüger 2003). In most cases, no salary is provided for participants and it is considered to be less professionalised (Haasler and Gottschall 2015). Due to this divided structure of the German VET system, which exists until today, gender segregation is strongly institutionalised by the different organisational forms of VET for female- and male-typical occupations. Occupations are constructed for a gender-specific target group and therefore their internal structure is designed to induce gendered choices and trajectories. Thus, occupations are not gender-neutral.

The roots of gendered occupational choices can be traced back to childhood, where children express gendered occupational preferences shaped by parental gender roles and experiences in social interactions (e.g. Lawson, Crouter, and McHale 2015; Polavieja and Platt 2014; Teig and Susskind 2008). The consequential gender segregation in VET and field of study is a decisive explanation for later labour market segregation and related social class affiliation (e.g. Charles and Bradley 2009; Gundert and Karl Ulrich Mayer 2012). There is various empirical evidence for the path dependency of labour market outcomes, e.g. occupational preferences in youth are strong predictors of occupations in adulthood (see e.g. Schoon and S. Parsons 2002; Alm and Bäckman 2014) and there is a strong correlation between gender segregation in VET and field of study with early labour market outcomes and occupational segregation (Smyth 2005; Smyth and Steinmetz 2008; 2015). For this reason, it is important to analyse occupational gender segregation from a life course perspective, by taking into account this path dependency, where of initial occupational aspirations before entry into the labour market lay the foundation for subsequent occupational decisions and biographies. The topics of the subprojects and their order reflect this path dependency. In the following, their titles, research objects and specific contributions are briefly outlined and related to the overall research question.

- Paper 1: *Gendered occupational aspirations of boys and girls in Germany: The impact of local VET and labour markets*

  The first subproject addresses the question of how adolescent boys' and girls' occupational aspirations are affected by opportunities for their realisation due to the overall occupational structure of the local VET and labour market. Building on Gottfredson's (2002) theory of circumscription and compromise, this study contributes to the small but dynamic field of research that attributes occupational aspirations to local VET and labour market characteristics (e.g. Hillmert, Hartung, and Weßling 2017; Wicht and Ludwig-Mayerhofer 2014). Using logistic multi-level analyses, my co-author Prof.

Marita Jacob and I find that regional variation in occupational opportunity structures within the local district are an important determinant of occupational aspirations of boys and girls. In particular, we can show that the competitiveness of the labour market has heterogeneous effects on boys and girls. In regions with weak competition on the local VET market, boys are likely to aspire to occupations for which there are apprenticeships and jobs available within the region, while girls aspire generally to mixed occupations, irrespective of the occupational opportunity structure within the local context. However, in contexts with high competition for apprenticeships, girl's aspirations are also oriented towards availability of apprenticeships and jobs. The comparison of the occupational structure within the VET and the labour market suggest that adolescents already have a long-term perspective, because it's not only the occupational structure of VET that matters, but also the occupational structure of the labour market which offers opportunities (or constrains) for later working careers.

- Paper 2: The Role of Occupational Segregation for Gender-specific Employment Patterns in West Germany

  In the second subproject, which is single-authored, I examine consequences of gender-(a)typical occupational decisions for employment patterns of men and women. By using a longitudinal design, conceptualising employment biographies as sequences, this study analyses how occupations differ with respect to opportunities for specific forms of employment, e.g. part-time work. By doing so, the study contributes to disentangle individual and contextual influences, pointing out the relevance of internal structures of occupations providing opportunities (or constrains) for different forms of employment. More precisely, this study compares employment patterns of men in female-typical occupations with those of their female colleagues and those of men in male-typical occupations. Applying sequence cluster analysis and subsequent multinomial-logistic regressions, I find that men in female occupations are more likely to have male-typical stable employment patterns than their female colleagues but are also more likely to have part-time dominated employment patterns than men in mixed and male-typical occupations. This new perspective contributes to separate occupation-specific modes of employment from individual gender-specific employment decisions. The results confirm that occupations with different gender-type vary in their opportunities especially for part-time work arrangements and (educational) interruptions for men and women.

- Paper 3: *Glass Ceilings, Glass Escalators and Revolving Doors: Comparing Gendered Occupational Trajectories and the Upward Mobility of Men and Women in West Germany*

  The third subproject, co-authored with Ramsey Wise, analyses opportunities for upward occupational mobility within gendered occupations and thus addresses the question of how horizontal and vertical gender segregation are interrelated. Up to now, there are only few studies investigating this interrelation explicitly. Moreover, the few existing studies analyse specific events or states at a specific time and do not take into account the multidimensionality of vertical segregation, which amount to a cumulative disadvantage for women. We add to and extend these previous studies by taking into account at least two dimensions 1) the access to and 2) the continuance in leadership positions. Furthermore, our study is the first that uses labour market segmentation theory as theoretical framework to explain different opportunity structures for promotion in gender-typical occupations. The results of sequence visualisation and subsequent event history analyses confirm that gender-specific occupations differ in their opportunities for promotion. While male-typical occupations offer the best opportunities for both dimensions - access to and continuance in leadership - without significant gender differences, promotion in female-typical occupations seem to be constrained by the lack of opportunities, but also by gender norms, because women in female-typical occupations are more disadvantage compared to women in male-typical ones, then men in female-typical occupations compared to men in male typical occupations. Thus, a male advantage occurs here in form of a smaller disadvantage.

1.2 Definitions and Theoretical Framework

The object of this dissertation is the analysis of occupation-specific structures with respect to access opportunities, subsequent employment patterns, and career perspectives. The key concepts and main independent variables will be defined in the following. Subsequently, I will outline the alternative theoretical explanation used in these dissertation projects and clarify their predictions for the previously defined outcomes.

1.2.1 Definition of the Research Objects

To understand the phenomenon of gender segregation in the labour market and to explain its consequences, it is necessary to distinguish between horizontal and vertical gender

segregation (Charles 2003; Charles and Grusky 2004). In the following, both concepts are explained briefly before explaining the conceptualization of the main objects.

Horizontal gender segregation describes the phenomenon that men and women continue to work in different occupations, which can partly be explained by gender-specific tasks involved in different occupations. Gender-essentialist ideologies categorise tasks as female- or male-typical: interpersonal interaction, nurturance, and personal service are, for example, viewed as prototypically female, physical exertion is regarded as typically male (Charles 2003). This categorisation is based on "stereotypes about natural male and female characteristics" (Charles and Grusky 2004) which are cultural norms transmitted and maintained, for example, by significant others (e.g. family and friends) that influence individual attitudes and behaviour. However, this differentiation by gender-typical tasks does not imply an order and therefore measures difference without inequality (Blackburn, Jarman, and Brooks 2000).

In contrast to horizontal segregation, which does not imply an order by any criterion, *vertical segregation* describes the distribution of men and women within the hierarchical structure of the labour market and thus captures inequality. The ordering is based on more or less 'desirable' attributes such as income, prestige and decision-making power. Therefore, vertical gender segregation is seen as problematic because – due to gendered status beliefs and perceived incongruity of role characteristics that are traditionally attributed to women and leaders – women are widely excluded from leadership and thus lack assertiveness (e.g. Ridgeway 2001; Eagly and Karau 2002; Charles 2003).

This dissertation project focuses on the causes and consequences of horizontal occupational segregation and its interrelation with vertical inequality. Taking on the life course perspective, the first sub-study of this dissertation project investigates adolescents before they actually enter the labour market. *Realistic occupational aspirations* are seen as one cause for horizontal gender segregation and thus of fundamental interest for later societal placement. In contrast to idealistic occupational preferences, which are assumed to be desires, wishes and interests regarding a future job that adolescents would like to achieve in an ideal, unconstrained world, adolescents' realistic occupational aspirations express what they reasonably expect to achieve through their capabilities, resources and under given external circumstances (Wicht and Ludwig-Mayerhofer 2014). These realistic aspirations are assumed to be an anticipatory compromise of young adults who adapt their idealistic occupational preferences taking into account opportunities and constraints (Gottfredson 1981).

Subsequently, realistic occupational aspirations are developed shortly before the transition from school to work and thus before entering the gendered occupational structure of the VET and labour market.

After labour market entry, the implemented occupational choices – which reflect realised occupational aspirations – result on the macro-level in the horizontally and vertically segregated occupations. On the individual-level, they confront men and women with occupation-specific opportunities and constrains for different employment patterns and career prospects. Subsequently, in papers two and three, I analyse whether gender-specific employment patterns and upward occupational mobility can be explained – at least partly – by horizontal gender segregation. Therefore, especially the last subproject explicitly examines the interrelation of vertical and horizontal segregation.

Employment patterns are conceptualized as "categorical sequences, [...] represented by an ordered list of successive elements chosen from a finite alphabet" (Studer and Ritschard 2016). This means that each individual employment pattern is represented by a sequence of different states representing full-time and part-time work arrangements as well as interruptions of unemployment for education or family reasons, taking into account the full complexity of longitudinal life course data.

Upward occupational mobility and thus gender inequality in promotion comprises two dimensions 1) access to and 2) persistence in leadership positions. For this purpose, leadership positions are defined as roles with more responsibilities and prestige such as supervisors and executives, managing directors, and legislators. These "higher" positions, implying 'desirable' attributes such as income and decision-making power, are contrasted with being part of the "normal" workforce.

1.2.2 Theoretical Framework

For the theoretical framework of this dissertation, I draw from at least three disciplines: economics, sociology and social psychology. While the different theoretical approaches are largely competing, they are also supplements to some extent. In all three disciplines, occupational gender segregation is seen as a result of a gendered career choice process. Thus, they concentrate on individual-level supply-side explanations for individual choices under (contextual) constrains. Additional causes of gender segregation in the form of access constrains e.g. discrimination by gatekeepers – which take into account the demand-side – are here integrated as perceived or expected barriers of accessibility (constrains) influencing

individual choices. This section discusses the main theoretical explanations for contextual influences on gendered occupational aspirations and consequences of resulting occupational gender segregation with respect to employment patterns and upward occupational mobility.

Rational choices and segmented labour markets

Economic theories like the human capital theory assume that educational and occupational decisions are based on cost-benefit calculations that aim at the maximization of lifetime utility. Becker (1993) argues that men and women invest in different forms of specialised human capital due to their differences in biological commitment to the production and care of children. As women invest more physical effort during pregnancy, their interest to ensure optimal care for their offspring should be naturally higher than men's. Consequently, especially for married (heterosexual) couples, it is assumed to be most efficient that women specialise in childcare and other household activities and thus in "human capital that raises household efficiency (...) [while] (...) men invest mainly in capital that raises market efficiency" (Becker 1993: 39). In line with this argument, men are more productive in the market sector and thus have higher wages. The implied consequence is that men allocate as much time as possible to gainful employment to feed their families, and protect their wives "against abandonment and other adversities" (Becker 1993: 30), while women allocate their time primarily in childcare and other household responsibilities. Building on these basic assumptions, Polachek (1981) argued that women and men self-select into different occupations due to occupation-specific levels of atrophy, "defined as the loss of earnings potential that can be attributed to periods of work intermittency" (Polachek 1981: 62). As women expect to have more intermittent employment trajectories – compared to men who aim at permanent and full labour market participation – they invest in general human capital which is less risky compared to occupation-specific or firm-specific human capital because the latter loses its value with occupation or job changes. However, this requires that adolescents already plan their labour force participation (and family formation including their partner's employment) over the whole life cycle when developing occupational aspirations and investing in respective human capital.

Occupational aspirations and subsequent occupational choices are seen as a result of cost-benefit calculations to maximize lifelong (household) income, considering the gendered division of labour within households and families due to relative efficiencies. In line with this assumption, one can argue that the availability of apprenticeships and the occupational labour market structure within the local context reflect opportunities for the realisation of

occupational aspirations and thus may influence cost-benefit calculations by decreasing or increasing the required effort to enter specific occupations.

With respect to the influence of gendered occupational choices on later employment trajectories, the economic theory implies the assumption that occupations differ with respect to their opportunity structure for specific work arrangements. While men select into occupations that reward permanent and fulltime labour market participation, women self-select into occupations that allow more intermittent employment trajectories. This perspective seems to be very consistent with the historical development of female labour force participation and the emergence of female occupational niches mentioned earlier. Therefore, it can be presumed that occupational choices reflect preferences or needs for a specific employment pattern. With regard to upward occupational mobility, one can argue in line with economic theory that occupations, which are attractive to men, can be expected to have good opportunities for promotion because men maximize market efficiency, and leadership positions should have the highest rewards.

A more detailed argument for internal structures of occupations supporting (or inhibiting) upward occupational mobility can be found in labour market segmentation theory (Edwards 1979; Sengenberger 1987). Here it is argued that the growth of large firms has contributed to labour market segmentation because hierarchical career ladders were created to secure employee commitment, control the workplace, and to reduce sunk costs caused by worker turnover (Farkas and England 1988; Sørensen and Kalleberg 1981). These developments, however, had mainly taken place in male-typical occupations. Female-typical occupations, in contrast, are mainly low-skilled service sector or semi- and high-skilled professional occupations. The first type is associated with low-wage, dead-end jobs that do not provide opportunities for career advancement at all (Jacobs 1989; Charles and Grusky 2004; Williams 2013). The second type consists of occupation-specific professions (e.g. teaching professions or health professions). Consequently, it can be expected that female-typical occupations offer fewer opportunities for promotion than male-typical occupations.

Cultural norms, gender roles, and role congruity

Sociological theories address gender differences with respect to educational and occupational decisions by the incorporation of cultural gender norms through socialisation processes (e.g. Charles and Bradley 2009). Various theories build on the assumption that babies are born without gender-specific differences, but develop gendered attitudes through socialisation, especially within the nuclear family during childhood, but also later on via interactions with

their peer groups and wider social contexts (e.g. Parsons and Bales 1955; West and Zimmerman 1987; Stets and Burke 2000; Davis and Greenstein 2009). Cultural gender norms serve as orientation structure for socially desirable behaviour which is based on normative attitudes and beliefs about gender appropriateness. These cultural norms lead to social recognition of conformity, while behaviour deviating from these norms implies the risk of social sanctions. Thus, gender-specific occupational preferences and subsequent aspirations are seen as the result of perceived conformity of occupational and gender role characteristics (Teig and Susskind 2008). For example, female-dominated occupations such as social work and healthcare are perceived as well aligned with the traditional female role of family caregiver.

The overall occupational structure of the local context implies more (or fewer) role models for gender appropriate behaviour. Therefore, it may be assumed that extensive opportunities for gender-typical occupations imply higher gender-typicality in aspirations. Vice versa, if the local occupational structure offers fewer opportunities in gender-typical occupations, it will be more likely that adolescent boys and girls are surrounded by role models who already work in gender-atypical occupations and thus may be more open to atypical occupational choices (Alm and Bäckman 2014).

Similarly, it can be argued that cultural norms within occupations facilitate or impede specific work arrangements. It can be expected that the internal structure of occupations is correlated with occupational cultures that develop "through social interaction, shared experience, common training and affiliation, mutual support, associated values and norms, and similar personal characteristics of members of a particular occupational group" (Johnson, Koh, and Killough 2009: 320). In female-typical occupations this would facilitate more flexible work arrangements for women and for men. In male-typical occupations these norms may lead to a higher pressure for employment commitment. Evidence points at least to the existence of a "scar effect" of previous female-typical employment trajectories for female employment in male-typical occupations which increase the likelihood of revolving doors (Torre 2014).

Role congruity theory ties up at this point and offers explanations not only for occupational choice but also for career advancement. It argues that congruity between gender and occupational roles is not only affecting occupational choices. As leadership characteristics are typically attributed to men, demands for role congruity also support vertical segregation. The perceived incongruity between leadership roles and characteristics traditionally attributed to women is assumed to stigmatise women as less appropriate for leadership (Eagly and Karau

2002). Furthermore, female leaders violate cultural gender norms and are therefore often devalued in comparison to their male counterparts (e.g. England et al. 1994; Ridgeway 2001).

However, empirical research indicates that there is a shift from general gender to motherhood norms. While especially in younger cohorts, gender norms are changing towards a more egalitarian division of labour, norms of motherhood have not changed simultaneously or to the same extend as general gender norms (Grunow, Schulz, and Blossfeld 2012). Especially childbirth seems to be a key event which causes gender role attitudes to regress to more traditional ones (e.g. Schober 2013; Kühhirt 2012). The "cultural ideals of 'the good mother' who stays home with her children" (Grunow, Hofmeister, and Buchholz 2006), support work interruptions and subsequent part-time work for women entering motherhood, while men's employment trajectories seem to be unaffected, even if they have more egalitarian gender norms, and independently of their involvement in housework (e.g. Schober 2013). Reasons for this fact are seen inter alia in welfare policies which – especially in Germany – support a traditional division of labour (Bühlmann, Elcheroth, and Tettamanti 2010).

The process of career development and the adaptation of occupational preferences

Social psychological theories on the development of occupational aspirations and choices often focus on individual features such as cognitive ability as well as vocational interests. The nearer social context is integrated as supportive or obstructive environment. Wider environmental influences usually receive only marginal attention or no attention at all.

Similarly to the economic theory, Holland's career choice theory assumes that individuals self-select into occupations that offer the highest congruence between their own personality and occupation-specific working environments to maximize the potential career-related outcomes, such as satisfaction, persistence, or achievement (Holland 1997).

Other developmental theories delve deeper into career developmental processes. Supper's theory comprises a career development theory (Super 1957), a developmental self-concept theory (Super 1988), and his life-span, life-space theory (Super 1980). They are seen as different pieces of the same puzzle and aim to capture the complexity of the career choice process. Especially, life-span, life-space theory goes far beyond Holland's career choice theory. It takes on a very dynamic view of careers, where work is no longer the central role of a person's life but one life space among others. Different individual roles in life are related to different contexts. Savickas (1997; 2005) tried to integrate all three segments of Supper into a more parsimonious theoretical framework, referring to career adaptability and career

construction. He argues that individuals pursue to maximise the congruence of their (vocational) self-concepts with the respective position, "while at the same time becoming more like the person she or he wants to be" (Savickas 1997: 253). In the process of clarifying their vocational identities, individuals compare their occupational preferences with the opportunity structure for realisation. Opportunity structure is here meant as e.g. perceived barriers due to discrimination by gatekeepers, however, not as availability of jobs.

Similar to Savickas's approach, the social cognitive career theory (SCCT), developed by Lent, Brown, & Hackett (1994; 2000) and based on Bandura's general social cognitive theory (1986), aims to integrate various pieces of a puzzle. This approach focuses on situation-specific dynamics in which individuals change and develop their interests, goals and decisions in line with changing self-efficacy and outcome expectations. Individual abilities and values as well as learning experiences influence self-efficacy and outcome expectations. This interrelation is moderated by contextual influences such as supportive environments or anticipated disparagement of a certain option by significant others. Occupational aspirations – here defined as "provisional occupational goals or daydreams" – emerge within the career choice process and become increasingly stable and realistic over time. Opportunity structures as environmental influences are defined as e.g. limited economic or educational opportunities (Lent, Brown, & Hackett 1994).

The most elaborated explanation regarding how opportunity structures – defined as concrete realisation chances and barriers – may influence and change occupational aspirations, is given by Gottfredson's theory of circumscription and compromise (1981). She postulates four consecutive stages of a career choice process in which children first develop an abstract idea of jobs and their social values recognizing differences in income, status, and effort. Subsequently, children identify the zone of acceptable alternative occupations, based on the assessment of the congruence of the so called occupational images, which contain the occupations' gender-type and prestige, and children's own occupational self-concept, which is e.g. based on children's own gender, social background, and vocational interests. In a further step, resulting preferences are adjusted according to perceived accessibility. Thus, final realistic occupational aspirations are defined as a preferred occupation which represent the best alternative due to perceived opportunities and constrains.

For the explanation of occupation-specific forms of employment and upward occupational mobility one can also draw, in particular, on Super's life-span, life-space theory (Super 1980). Work as one life space is argued to be influenced by different individual roles in life and

interrelated with different contexts. Therefore, decisions for specific employment patterns or career ambitions may be the result of balancing work related roles and e.g. parental or partnership roles within the context of an occupation-specific structure for their implementation.

1.3 Extended Summaries

This section presents an overview of the subprojects of this dissertation. Table 1.1 outlines the research questions, most important variables, statistical methods and units. In the following, an extended summary of each sub-study can be found.

Table 1. 1 Overview of the Subprojects

	Paper 1	**Paper 2**	**Paper 3**
Title	Gendered occupational aspirations of boys and girls in Germany: The impact of local VET and labour markets	Gender-Specific Employment Patterns in West Germany: Reinforced by Occupational Segregation?	Glass Ceilings, Glass Escalators and Revolving Doors: Comparing Gendered Occupational Trajectories and the Upward Mobility of Men and Women in West Germany
Research Question	Whether, and in what respect, do local labour market conditions have an impact on adolescent boys and girls occupational aspirations?	1) Do employment patterns differ between occupations with different gender composition – irrespective of employees' gender? 2) Do employment patterns of men in female occupations assimilate to those of women?	1) Do men demonstrate a comparative advantage regarding access to and staying in a leadership position? 2) To what extent does occupational segregation explain gender differences in upward occupational mobility? 3) Do gender effects vary across gender-typical occupations?
Dependent Variable	Realistic occupational aspiration	Type of employment pattern (Clustermembership)	a) Access to leadership b) Leaving leadership
Core independent Variables	a) Overall occupational structure of local VET and Labour Markets, b) competition in local VET market	Gender-type of occupation held in obs. time	a) Gender, b) Gender-type of occupation, c) Interaction of both
Data	NEPS[3] SC 4 (students in grade 9)	NEPS SC 6 (adults)	NEPS SC 6 (adults)
Statistical Method	Multi-level logistic regressions (2 levels)	Sequence analysis & multinomial logistic regressions	Sequence visualization & event history analysis
Statistical Units	Students in rural districts	Men & women in (a)typical occupations	Men & women in (a)typical occupations

[3] National Educational Panel Study (NEPS)

Current status	Revised and resubmitted to *"Journal of Vocational Education and Training"*	Prepared for submission	Forthcoming in *"Sequence Analysis and Related Approaches"*

1.3.1 Gendered Occupational Aspirations of Boys and Girls in Germany: The Impact of Local VET and Labour Markets

As stated above, occupational gender segregation as a macro-level phenomenon reflects gender-specific individual occupational choices under individual internal, external, and contextual constrains. These occupational choices are the result of a long-term developmental processes which starts quite early in life and leads to already gender-specific choices of subjects and VET opportunities. Especially in Germany, strong institutional regulations of the life course through education and labour, inhibit later occupational changes because standardised vocational certificates restrict the access to specific occupations (Trappe and Rosenfeld 2004; Solga and Konietzka 2000).

Consequently, I started my dissertation project by analyzing influences on adolescents' gendered occupational aspirations. With this study, my co-author Prof. Marita Jacob and I contribute to previous research on occupational aspirations by taking into account the overall occupational structure of local VET and labour markets as well as competition for apprenticeships within local districts, which affect one's chances for realising occupational preferences.

Previous research has investigated that societal norms affect gendered occupational aspirations e.g. through parents, peers and teachers (e.g. Polavieja and Platt 2014; Alm and Bäckman 2014; Jacobs, Chhin, and Bleeker 2006; Chhin, Bleeker, and Jacobs 2008; Dryler 1998; Frome and Eccles 1998). Most of these studies implicitly assume that occupational gender segregation is a result of gender-specific occupational decisions that are based on (perceived) abilities, beliefs about gender roles or gender-specific evaluations of later working conditions and labour market outcomes. However, they do not account for exogenous constraints that young adults may consider when developing their occupational aspirations. Recent research has already shown that local labour market conditions, e.g. the unemployment rate, affect adolescents' transition probabilities into VET (e.g. Hillmert, Hartung, and Weßling 2017; Weßling, Hartung, and Hillmert 2015). This study adds to and extends this previous research by investigating the role of local VET and labour market characteristics for occupational aspirations of adolescent boys and girls. The research questions are: Do the opportunities and constraints in the local VET and labour market affect

the gendered occupational aspirations of school leavers in Germany, and if so, to what extent? Do boys and girls differ in this respect?

Building on Gottredson's career developmental theory of "circumscription and compromise" outlined in section 2 of this introduction, we assume that adolescents' final realistic occupational aspirations result from the evaluation of their preferences against given opportunities and constraints within their local contexts. This means: Before actually entering into VET, adolescents have already adapted their initial occupational preferences to given opportunities (e.g. quantity of apprenticeships, available jobs in the respective category) and to expected barriers (e.g. competition with other school leavers).

More precisely, we first assume that gender-specific occupational aspirations are observed more frequently when the opportunity structure supports their realisation. That means, we expect boys and girls to be more likely to aspire to gender-typical occupations if sufficient opportunities for gender-typical occupations are available in their local context. Furthermore, it is assumed that sex-type boundaries are less rigid for women than for men. Hence, the association of local opportunities and gender-type of occupational aspiration is expected to be more pronounced for boys than for girls.

In addition to the availability of apprenticeships and jobs (opportunities), we assume that competition for apprenticeships (constrains) restrict realisation chances and may force adolescents to adapt their preferences also regarding the gender-type of occupations, if necessary. On the one hand, this may mean that sex-type boundaries do not have to be crossed if competition is low, even if the overall amount of opportunities is small. On the other hand, high competition may also cause young adults to aspire to gender-typical occupations because of employers' preferences for a specific gender and subsequent discrimination against candidates of the opposite one. In this case, even gender-atypical preferences may be adapted to gender-typical aspirations in competitive contexts.

Using data from starting cohort four (students in grade 9) of the German National Educational Panel Study (NEPS), the results of multi-level logistic regressions indicate that regional VET and labour markets indeed have an impact on realistic job aspirations of adolescents. For boys' realistic occupational aspirations our results tend to be generally in line with our expectations, even if only few effects are statistically significant. Boys are more likely to aspire to occupations that offer more opportunities in the local context, at least in low-competition districts. The comparison of indicators for VET and labour market opportunities

leads to the conclusion that boys are more perceptive of long-term realisation opportunities within the labour market than short-term opportunities in the form of local VET offers.

Girls, in contrast, tend to aspire neither to gender-typical nor to gender-atypical occupations in districts with low competition. However, in competitive contexts, occupational aspirations are also oriented towards opportunity structures of the regional VET and labour market independently of the gender type of occupations. That means, girls' occupational aspirations are most likely to be gender congruent when the local context is highly competitive and offers many opportunities in female occupations. This may indicate that girls do not generally aspire to female-typical occupations but are aware of opportunities and constrains. They are more sensitive to competition, especially when they worry about being disadvantaged when competing with boys.

With respect to the overall research question, this result suggests that occupational structures of the local VET and labour market serve as opportunity structure, which can support gender-typical as well as atypical occupational aspirations for boys and girls. While boys' aspirations are directly oriented towards demand for specific occupations, the influence of exogenous circumstances on girls' occupational aspirations is more complex, and may keep them entrapped in traditionally female occupations, even if they aspire to gender neutral occupations.

1.3.2 Career Patterns of Men and Women in West Germany: Occupation-Specific Forms of Employment?

The second paper of this dissertation is single authored and examines opportunities for different employment patterns due to varying structures of occupations, which are rarely considered in previous research. As in the first sub-project, here again the focus is on the relevance of exogenous opportunities and constrains, but on the life cycle stage after labour market entry and thus on the consequences of gender-specific occupational choice.

Despite the positive trends towards higher educational attainment and greater labour market participation of women, substantial differences between typical male and female employment patterns remain stable or increase. While men continue to have fairly stable employment patterns, women's occupational trajectories are more complex, and seem to be more affected by flexibilisation processes (e.g. Widmer and Ritschard 2009).

Previous research on gendered occupational trajectories focuses on changes of gender differences over time, the influence of parenthood or the impact of family policies in a country comparative perspective. However, there is only little research on the internal structure of occupations, and thus on horizontal gender segregation as cause for gender-specific employment patterns (e.g. Hausmann, Kleinert, and Leuze 2015; Bächmann and Gatermann 2017). Investigating men's employment patterns in female-typical occupations and comparing them to those of their female colleagues, as well as to those of men in male-typical occupations is very promising for this purpose. If employment patterns of men in female occupations assimilate to those of their female counterparts, this would indicate that employment patterns are not only driven by gender-specific preferences or constrains, but accelerated by opportunity structures within occupations. Therefore, the focus of this paper is to investigate whether distinct employment patterns can be empirically identified and how they differ by gender and gender type of occupation. Thus, this paper asks: Do employment patterns differ between occupations with different gender compositions – irrespective of employees' gender? Do employment patterns of men in female occupations assimilate to those of women?

Male-typical employment patterns are expected to be continuously full-time dominated employment trajectories, while female employment patterns are probably more complex and heterogeneous, e.g. contain periods of family leave and part-time employment.

Theoretical explanations for gendered employment patterns argue via the division of gainful employment and domestic work. However, economic and sociological approaches build on different mechanisms. As outlined above, economic theories argue that educational and occupational decisions are the result of cost-benefit calculations that aim at utility maximization. Due to their differences in biological commitment to the production and care of children, women specialise in human capital that raises household efficiency and self-select into occupations where times outside the labour force are less costly. On the opposite, men invest mainly in capital that raises market efficiency and self-select into occupations with the highest returns for permanent fulltime employment (Becker 1993; Polachek 1981). Subsequently, opportunities for promotion as well as the loss in earnings potential are seen as occupational attributes and thus as part of the internal structure of occupations. This perspective seems to be consistent with the historical development of occupations in Western Germany. Therefore, I assume that occupations provide opportunities for different employment patterns irrespective of an employee's gender. More precisely, in line with this

argumentation, employment patterns of men in female-typical occupations should assimilate to those of their female colleagues.

However, previous research challenges this argument of efficiency as dominant mechanism. Okamoto and England (1999) find no relation between early plans for employment intermittency and employment in female-typical occupations. Furthermore, there is empirical evidence that men's engagement in housework as well as their labour market participation are unaffected by their wife's income and the entry into parenthood (e.g. Grunow, Schulz, and Blossfeld 2012; Kühhirt 2012; Schober 2013).

Sociological theories therefore argue that gendered occupational choices and subsequent employment patterns are the result of gender-specific socialization processes. As already stated above, they assume that individuals develop gendered attitudes through the incorporation of socially constructed gender roles, especially within the nuclear family during childhood and via interactions with their social contexts (e.g. Parsons and Bales 1955; West and Zimmerman 1987; Stets and Burke 2000; Davis and Greenstein 2009). To satisfy cultural gender norms and to prevent sanctions due to deviant behaviour, men focus on continuous full-time career patterns, while women's employment has to be compatible with their domestic responsibilities and the normative ideal of 'the good mother' who stays at home with her children. Recent research postulates a shift from traditional norms restricting women's employment in general to a motherhood penalty (e.g. Gangl and Ziefle 2009; Benard and Correll 2010). Following this line of argument, it can be expected that men are always striving for continuous fulltime employment even in female-typical occupations, while women differ in their employment patterns – mainly due to parenthood.

To test both explanations against each other, I use data from starting cohort six (adults) of the German National Educational Panel Study (NEPS) which contains retrospectively collected monthly information on educational and employment biographies of individuals born between 1944 and 1986. The analysis follows individuals from their first significant job for a period of 15 years to cover the time of family formation as well. I apply sequence analysis (distance and following cluster analysis) to identify different types of employment patterns which are subsequently used as dependent variable in multinomial logistic regression models.

The results show that men and women differ with respect to their cluster membership (type of employment pattern). Men, especially those without children, in female-typical or mixed occupations show a high similarity with men in male-typical occupations. However, there is

one exception: Being in the part-time dominated cluster seems to be dependent on the gender-type of occupation for men and for women and on parenthood. Regarding part-time work, fathers in female-typical occupations show no significant difference from mothers in female-typical occupations, but deviate significantly from those of fathers in male-typical occupations.

With respect to the overall research question, these results confirm the assumption that the structures of occupations offer different opportunities for specific employment patterns – at least with respect to part-time employment and interruptions. Furthermore, this study supports previous findings that restrictive motherhood norms support a "re-traditionalisation" (Grunow, Schulz, and Blossfeld 2007). Men – irrespective of the occupation held – never take a family leave. However, this is probably due to the fact that, during observation time, the legislative framework of the German welfare state prevented this. Therefore, it would be interesting to examine the effectiveness of recent changes in German family policies.

1.3.3 Glass Ceilings, Glass Escalators and Revolving Doors: Comparing Gendered Occupational Trajectories and the Upward Mobility of Men and Women in West Germany

In the third and last sub-project of this dissertation, my co-author Ramsey Wise and I analyse the interrelation of horizontal and vertical gender segregation. Men and women are not only segregated into different types of occupations, but also disproportionally represented in different levels of the occupational hierarchy and thus have different access to decision-making power. There is a large body of research analysing the female disadvantage in upward occupational mobility due to structural barriers commonly referred to as "glass ceilings" (e.g. Maume 1999a; Reskin 1993; Cotter et al. 2001). These barriers are often attributed to prejudice based on gender stereotypes of traditional gender roles (e.g. Eagly 2003; Eagly and Karau 2002) as well as discrimination and stigmatisation, particularly of working mothers (e.g. Aisenbrey, Evertsson, and Grunow 2009; Benard and Correll 2010; Budig, Misra, and Boeckmann 2012; Gangl and Ziefle 2009). Additionally, Williams (1992) points out that men entering female-typical domains are also advantaged with respect to career advancement – the so called "glass escalator effect".

Most of this previous research has primarily focused on the American or Scandinavian context. For Germany, empirical evidence is sparse. Ochsenfeld (2012) examined the influence of a gender-typical field of study on the gender gap in attaining a first management

position. Thus, this study considers only access into leadership, but does not consider a potential revolving door effect, which may force women out of leadership again. A recent country comparative analysis from Dämmrich and Blossfeld (2017) found in a cross-sectional research design that in Germany the likelihood of holding a supervisory position in male-typical occupations – unlike in female or mixed ones – seems to be not dependent on gender. The present study adds to and extends these previous findings by using a longitudinal design and taking into account two dimensions of a potential cumulative male advantage in career advancement: 1) the accessibility and 2) the likelihood to stay in a leadership position.

We aim to disentangle the interaction of gender and occupational gender composition (as part of the internal structure of occupations) on upward occupational mobility of men and women in Western Germany. Based on role congruity theory (Eagly and Karau 2002), which argues that leadership characteristics are typically attributed to men, we expect a gender effect irrespective of the occupational gender-type. The perceived incongruity between leadership roles and traditionally female role characteristics are assumed to stigmatise women as less appropriate for leadership and thus restrict access to as well as continuance in leadership positions (England et al. 1994; Ridgeway 2001).

Additionally, we assume that (irrespective of employees' gender) structures of male- and female-typical occupations differ in their opportunities for promotion, due to their location in different labour market segments (Edwards 1979; Sengenberger 1987). The growth of large firms contributed to the development of so called internal labour markets (ILM), where hierarchical career ladders were created as a means to secure employee commitment (Farkas and England 1988; Sørensen and Kalleberg 1981). However, these ILM can mainly be found in male-typical occupations. Female-typical occupations, on the opposite, are primarily located in low-skilled, service sector or semi- and high-skilled professional occupations and do not provide opportunities for career advancement to the same extend as male-typical occupations (Jacobs 1989; Charles and Grusky 2004; Williams 2013). Subsequently, we expect meaningful differences concerning the structures of occupations for upward occupational mobility, with more opportunities for career advancement in male-typical occupations compared to mixed and female-typical ones.

Beside these direct effects of gender and gender type of occupations on upward occupational mobility, previous research indicates that the internal structure of occupations may differ in its effect on gendered career trajectories (e.g. Dämmrich and Blossfeld 2017; Maume 1999b; Reskin and Roos 1990). However, the review of theoretical and empirical evidence offer

polarized viewpoints. On the one hand, especially Kanter's theory of "tokenism" argues that all tokens or minorities are disadvantaged due to heightened visibility and prejudice that contribute to processes of social exclusion (Kanter 1977). Therefore, men and women should be more likely to enter and remain in leadership positions in gender-typical occupations compared to atypical ones. On the other hand, role congruity theory argues that there is a general male-advantage for upward occupational mobility which is greater in female-typical occupations because men are "only" competing with women whose gender role attributes are conflicting with leadership role characteristics. Thus, the male advantage should be highest in female-typical occupations, due to gender-stereotyping prejudice in favour of men for leadership positions.

Taking into account the processual character of the expected multi-dimensional male advantage in occupational promotion, we apply sequence visualization and discrete event history analysis on biographical data from the NEPS. We find that the probability of upward occupational mobility is lowest in female-typical occupations and highest in male-typical occupations for both – men and women. However, there is no significant gender difference in career advancement in male-typical occupations. In female-typical occupations a male advantage is significantly visible in the form of a smaller disadvantage.

These results further emphasise the historically developed structure of occupations align with different opportunities – here regarding upward occupational mobility – which contribute to explain gender disparities in career advancement caused by occupational gender segregation. Opportunities for occupational promotion appear to be part of the internal structure of occupations. Furthermore, the results confirm that gender disparities cumulate over time; even women who manage to enter leadership positions are more likely to leave them again, at least in female-typical occupations. Thus, occupations do not only provide different opportunities for access to promotion, but also seem to differ with respect to the effectiveness of cultural gender and motherhood norms. It is conceivable that behaviour deviating from traditional gender and/or motherhood norms is accepted within structures of occupations that hamper congruence, while it is not accepted in settings that support gender appropriate behaviour. This means, men who intent to work part-time or take parental leave and thus deviate from traditional gender norms face more social sanctions in male-typical occupations than in female-typical ones. The same is true for career oriented women with high employment commitment who face fewer sanctions if they work in male-typical domains than in female ones.

1.4 Integration into the Literature

In this section I discuss how my dissertation project is related to the three disciplines: economics, sociology and social psychology. Furthermore, I will integrate all sub-studies into the most important scholarly discourses.

1.4.1 Integration into Disciplines

The first part of this dissertation examines the influence of the overall occupational structure providing opportunities (or constrains) for the realisation of gender (a)typical occupational aspirations which lead to gendered occupational choices and thus to occupational gender segregation. The assumed mechanism is an "anticipatory compromise" where adolescents adapt their initially developed idealistic occupational preferences into realistic aspirations based on perceived accessibility (e.g. availability of jobs and apprenticeships) of their preferred occupation (Gottfredson 1981). This paper therefore draws on social psychological theory and ties up with studies traditionally located in this discipline which analyse how career-relevant aspirations are influenced by contextual contains or perceived career barriers (e.g. Correll 2004; Watts et al. 2015). Gendered occupational aspirations are conceptualised as the result of a developmental process in childhood and adolescence, which is also the case in sociology. However, for sociologists this developmental process is mainly applied to gender role socialisation. Therefore, social psychologists provide complementary explanations for the constraining influence of structural conditions on individual choices and structural patterns of gender inequality (Correll, Thébaud, and Benard 2007).

The second subproject analyses the role of the internal structure of occupations facilitating (or impeding) different employment patterns. The underlying assumption is that opportunities for different employment patterns are a feature of occupations and thus part of the structures of occupations. The competing theoretical argumentations are drawn from economic and sociological theory. Economic theories assume that theses opportunity structures are basic properties of occupations and that occupational choices reflect gender-specific needs or preferences for the respective employment patterns. In line with this theory, employment patterns of men in female occupations should be similar to those of their female counterparts. In contrast to the economic perspective, sociologists argue that gender-specific employment patterns are the result of cultural gender norms which lead to individual gendered employment decisions. Thus, opportunities for specific employment patterns are not seen as genuine occupational attributes, but may become part of the internal structure of occupations through

occupational cultures in the form of shared values and norms. Subsequently, gender should be the main driving factor for the differentiation of typical employment patterns so that employment patterns of men in female-typical occupations should be similar to those of men in male-typical occupations. The results indicate, that gender and occupational opportunity structures affect employment patterns. Thus, this study suggests that both lines of argumentation contribute to greater understanding of the underlying mechanisms.

Economic and sociological reasoning is also combined for the third subproject. By analysing the interaction of gender and gender-type of occupation with respect to upward occupational mobility, this paper investigates how vertical and occupational segregation are interrelated. As in the second study, the assumed mechanism stems from sociology and emphasises gender as driving factor for disparities in upward occupational mobility. Drawing especially from role congruity theory, it is argued that women have fewer promotion opportunities because leadership roles are typically associated with characteristics attributed to men (Eagly and Karau 2002). Thus, women are expected to have fewer opportunities for promotion, due to the perceived incongruity of leadership roles with their own traditional female role characteristics. Additionally, it is assumed that women are more likely to be forced out of leadership again, due to the devaluation of female leaders who exhibit male characteristics and thus deviate from expected gender norms (England et al. 1994; Ridgeway 2001). The explanation of how occupations provide opportunities for promotion comes from labour market theory. It is argued that promotion opportunities are part of the structures of occupations and differ between the three labour market segments: internal, occupational and secondary labour markets. Male-typical occupations are assumed to offer more opportunities for promotion because of their location in the internal labour market segment, which is characterised by hierarchical career ladders to secure employee commitment. Female-typical occupations in contrast tend to be low-skilled service sector occupations within the secondary labour market and thus do not provide opportunities for career advancement, or they are semi- and high-skilled occupations in professional labour markets where opportunities for promotion only depend on licensure.

1.4.2 Integration into the Scholarly Discourse

As the focus of this dissertation is to investigate in how far opportunity structures for and within gendered occupations matter for the causes and consequences of occupational gender segregation, it contributes to different scholarly discourses. This dissertation adds to scholarly

discourses in the sociology of work and occupations that emphasises the influence of occupational choice which is not limited to the working life. It has a wider impact on e.g. family life, community involvement and for social stratification (e.g. Stewart, Prandy, and Blackburn 1980; Beck, Brater, and Daheim 1980; Charles and Grusky 2004; Dunkerley 2013).

Depending on the disciplinary context, gendered occupational choices are assumed to have different reasons. While economists argue that occupational choices are the result of cost-benefit calculations and subsequent gender-specific self-selection into occupations, sociologists trace gendered occupational choices back on gender norms incorporated via gender socialisation processes. Social psychological explanations include aspects of both, by modelling the developmental process of occupational preferences and following adjustment to perceived (external) constrains decisions.

The first paper captures this discourse on preferences under constrains by investigating the role of exogenous constrains in the form of opportunities for realising one's preferences given the overall occupational structures in local VET and labour markets. Adding to previous evidence that local and regional opportunity structures affect transition probabilities from school to vocational training (e.g. Hillmert, Hartung, and Weßling 2017; Weßling, Hartung, and Hillmert 2015; Kleinert, Vosseler, and Blien 2017), this subproject shows that secondary school leavers are indeed perceptive to the occupational structure of their local VET and labour markets. As they do not leave home before having finished general and vocational education, the occupational structure within their local district shapes adolescents' perception of the world of work and thus has a direct influence on their realistic occupational aspirations which seem to be adapted to perceived chances of realisation. This result is further in line with related findings that the chance of getting an apprenticeship and later job security are important aspects for the development of adolescents' occupational aspirations (e.g. Hirschi 2010; Großkurth and Reißig 2009; Vondracek et al. 1999; Seifert 1982). This study extends these findings by suggesting that even sex-type boundaries based on societal gender norms are crossed, if young adults face severe constraints for realising their occupational preferences. In this context, job opportunities as well as constrains (in the form of competition) affect both – boys and girls – however, in different ways. Without external constrains (low competition), girls aspire to gender-neutral occupations and thus neither to female- nor to male-typical ones. In highly competitive contexts girls' occupational aspirations are oriented towards opportunity structures and thus most likely to be gender congruent in competitive contexts which offer many opportunities in female-typical occupations.

However, this indicates that girls are aware of the lower wages and career prospects in female-typical occupations, but their competition aversion keeps them entrapped in gender-typical occupations. Contrary to girls', boys' occupational aspirations are generally oriented towards occupational opportunity structures, and more gender-neutral under competition.

The second and third subprojects examine consequences of occupational gender segregation for the gender-specific differentiation of employment trajectories and thus are located in the scholarly discourse in women's and gender studies as well as in social inequality research, which deals with gender as characteristic for status assignment. Women's and gender scholars argue that women's work is socially depreciated and therefore receive lower pay and fewer opportunities for career advancement. However, there is no consensus if the devaluation – reflected e.g. in lower pay – refers to female work tasks and thus to female-typical occupations (also for men) or to working women in general. While Hausmann, Kleinert, and Leuze (2015) show for Germany that working in female dominated occupations affects the wages of women but not necessarily the wages of men, other studies demonstrate that occupations with a higher share of female employees pay less – also for men (Aisenbrey and Brückner 2008; Busch 2013a; Leuze and Strauss 2009).

The results of subprojects two and three also indicate that the internal structure of occupations is of higher importance for work-related gender differences. With respect to gender-specific employment patterns, paper two shows that men in female-typical occupations do not differ from their female colleagues with respect to part-time dominated employment patterns. Paper three further shows that women do not differ compared to men regarding upward occupational mobility when working in male-typical occupations. And men in female-typical occupations are also less likely to enter and to stay in leadership positions compared to men in male occupations, even if this disadvantage is smaller compared to women. The findings of both sub-projects therefore counter devaluation scholars.

The devaluation hypotheses is further challenged by the finding that prestige – as a more direct measure of valuation than wage – is not linearly related to the share of female employees within an occupation. Magnusson (2008) can show with Swedish data that mixed occupations have higher prestige than female- or male-typical occupations. Ochsenfeld (2014) further reveals that lower wage levels associated with female-typical fields of study can be attributed to gender role socialisation which leads to gendered self-selection into specific occupations.

In addition to socialisation-based self-selection, taking together the results of papers two and three further suggest that deviating from traditional gender (and especially motherhood) norms is more likely in gender-atypical settings. While men are more able to deviate from male-typical behaviour with respect to employment patterns in female-typical occupations, the same is true for women rising up the ladder of success in male-typical occupations. The higher female disadvantage for upward occupational mobility in female-typical occupations makes this most visible. Consequently, this study supports the view that occupations significantly matter for hierarchical stratification but men and women differ at least partly in their possibility to use the opportunity structures of occupations.

1.5 Status of Studies and Contribution of Co-Authors

Chapter 2, *Gendered occupational aspirations of boys and girls in Germany: The impact of local VET and labour markets* has been co-authored by Prof. Dr. Marita Jacob, University of Cologne. I am the first author of this article. The article has been revised and re-submitted for publication to the Journal of Vocational Education and Training (JVET). The contributions to this study can be differentiated as follows:

Lydia Malin: Development of the research question and the theoretical framework; review of research literature; data preparation and empirical analysis; discussion of the results.

Prof. Dr. Marita Jacob: Streamlining of the theoretical argumentation and hypotheses; feedback on empirical strategy; revisions of all parts of the study.

Chapter 3, *"The role of occupational segregation for gender-specific employment patterns in West Germany",* is single-authored. The article has been prepared for journal submission.

Chapter 4, "*Glass Ceilings, Glass Escalators and Revolving Doors: Comparing Gendered Occupational Trajectories and the Upward Mobility of Men and Women in West Germany*", is co-authored by Ramsey Wise. I am the first author of this article. The article is forthcoming in: Gilbert Ritschard and Matthias Studer, 2018, "Sequence Analysis and Related Approaches: Innovative Methods and Applications", Springer Series Life Course and Social Policies. The contributions to this study can be differentiated as follows:

Lydia Malin: Development of the research question; review of research literature; supplementary contribution to the theoretical framework, data preparation and empirical analysis; discussion of the results.

Ramsey Wise: Development of theoretical framework of labour market segmentation; feedback on empirical strategy; revisions of all parts of the study.

Chapter 2

Gendered Occupational Aspirations of Boys and Girls in Germany: The Impact of Local VET and Labour Markets

Co-Authored with Prof. Marita Jacob

Abstract

Gender segregation in vocational education and training in different occupations is observed in many European countries. This occupational gender segregation depends on — among other factors — the initial occupational aspirations of adolescents. While previous research has mainly focused on individual-level explanations and on the family context, this study investigates the influence of local vocational education and training – and labour markets – on adolescent boys' and girls' occupational aspirations. More precisely, we look at (1) the occupational structure of local VET and labour markets and (2) competition for vocational educational and training opportunities. Using data from the German National Educational Panel Study (NEPS) of youth in grade 9 (age 15/16), we find that boys' aspirations are oriented towards occupational opportunities in the local labour market and that they vary with competition. Girls' aspirations are less likely to be gender-typical – neither female nor male – if there is low competition. However, with higher competition, girls also orient their aspirations towards occupational opportunities. Even if effect sizes of local context are small, we do find empirical evidence that contexts matter.

Keywords: Gender Segregation, Occupational Aspirations, VET Market, Contextual Effects, Multi-Level Analysis, Germany

2.1 Introduction

Occupational gender segregation is one of the main explanations for gender inequalities in labour market outcomes e.g. income, occupational status, and job quality (e.g. Stier and Yaish 2014; Charles and Grusky 2004; England 2005). Occupational gender segregation already begins in vocational education and training (VET), a phenomenon observed in many European countries (e.g. Smyth and Steinmetz 2015; Reisel, Hegna, and Imdorf 2015; Butler and Ferrier 2006). This segregation is (to large parts) a result of gender-specific occupational aspirations of adolescents respective the realisation of these aspirations (e.g. Alm 2015; Schoon 2001). In our paper we will examine whether and in what respect (gendered) occupational aspirations of adolescents are prone to the societal environment, particularly looking at contextual conditions in the local labour market and in VET.

Gender differences in occupational aspirations have been explored by numerous studies (e.g. Busch-Heizmann 2015; Polavieja and Platt 2014; Alm and Bäckman 2014; Flouri et al. 2015; Hardie 2015; Schoon and Eccles 2014), which have consistently shown that girls are more likely to aspire to female-dominated occupations, while boys are more likely to aspire to male-dominated occupations. Most of these studies implicitly assume that aspirations are expressed 'freely,' and that occupational gender segregation is a result of decisions that align e.g. with (perceived) gender-specific abilities, gender socialization, beliefs about gender roles or gender-specific evaluations of later labour market outcomes. Such supply-side oriented theoretical considerations do not account for exogenous constraints that young adults may consider when thinking about their future occupations and working careers. Recent research has been increasingly interested in such local and regional opportunity structures for adolescent's aspirations and labour market outcomes (e.g. Hillmert, Hartung, and Weßling 2017; Wicht and Ludwig-Mayerhofer 2014). We contribute to this emerging strand of research by looking specifically at the local VET and labour market characteristics that we expect to structure the occupational aspirations of young adults.

In a broader sense, our approach contributes to a perspective on adolescents' occupational aspirations embedded in exogenous contextual opportunities and constraints. We assume that the perceived accessibility and availability of jobs shape occupational aspirations and may lead to an adjustment of aspirations. In an 'anticipatory compromise' before entering the labour market, young adults adapt their 'idealistic' occupational preferences into 'realistic' aspirations that take into account both opportunities and constraints (cf. Gottfredson 1981). For example, adolescents consider the local structures of VET – and eventual labour market

opportunities – when expressing 'realistic' occupational aspirations shortly before leaving school. In particular, we focus on differences between boys' and girls' gendered occupational aspirations and how these aspirations are (differently) affected by spatial context.

Against this background, we want to answer the following research question: Do the opportunities and constraints in the local VET and labour market affect the gendered occupational aspirations of school leavers in Germany, and if so, to what extent? Do boys and girls differ in this respect?

We examine the case of Germany, where we observe rather high gender segregation in VET and in the labour market, as well as low occupational mobility in later working life, particularly when compared, e.g., to the US (DiPrete 2002) or to France (Haasler and Gottschall 2015). The low occupational mobility in Germany can be explained by the strong occupational specificity of its non-academic VET-system, which restricts occupational mobility later on. Therefore, opting for non-academic vocational training is a very important stage in the lives of adolescents with regard to their later occupational and working careers, as initial occupational aspirations and their realisation strongly affect later labour market opportunities (cf. Schoon 2001; Smyth and Steinmetz 2015). However, our theoretical considerations and empirical findings are not limited to the German case as occupational gender segregation is a consistent pattern in most industrialized countries. The processes how local labour market conditions may affect occupational aspirations can in principle be generalized to other countries even without a strongly institutionalised VET system and gendered aspirations resp. labour market entry could be similarly affected.

In our empirical analyses, we use data from the German National Educational Panel Study (NEPS, starting cohort 4), a large-scale panel study that provides high quality information on youth in grade nine (approx. age 15/16). The results of our multi-level logistic regressions show that boys' aspirations are indeed oriented towards occupational opportunities, while girls' aspirations seem to be affected by opportunity structures only if the local VET market is competitive. In low-competition regions, the aspirations of adolescents tend to be less gender-typical, and both girls and boys aspire to gender-balanced occupations instead of female or male ones.

2.2 Background: Vocational Education and Training in Germany

2.2.1 Firm-based and School-based Training in Germany

When analysing occupational aspirations of adolescents in Germany and how they might vary with the local context, the particular institutional setting of the German school and VET system has to be taken into account. The educational system in Germany is characterized by two peculiarities: distinct hierarchical tracking in school, leading to different levels of educational attainment, and the importance of (non-academic) VET in well-defined occupations[4]. The prominent role of VET is associated with a differentiation of clear occupational profiles in the labour market. Hence, particularly for school leavers in non-academic school tracks and/or for those not aiming at higher education, the transition from school to training and choice of (training) occupation may have strong implications for their later working life.

Broadly speaking, there are two major branches of VET in Germany: the dual system of mainly firm-based training combined with general schooling (apprenticeships) and the fully qualifying school-based vocational education programs.[5] Vocational training in the dual system is still the main pathway for school leavers in Germany, in particular for those not entitled to enrol in higher education. For example, in 2017 more than 500.000 training contracts have been newly established (BIBB 2018: 29). In 2016, among the population of the respective age group (16 to 24 year olds) 52 percent have ever entered an apprenticeship (BIBB 2018: Table A5.8-5).[6]

There are no formal restrictions to access dual vocational training, but allocation of applicants to training places is market based: School leavers that seek for an apprenticeship usually apply directly to companies, where the selection of candidates is incumbent on the training companies, and thus prone to fluctuations in demand and supply (BIBB 2018: 30; Kleinert and Jacob 2013). Furthermore, employers and trade unions have considerable influence on the content and form of dual VET. Therefore, apprenticeships are highly standardized and occupation-specific (for more details see Hippach-Schneider and Huismann 2016). Men more

[4] Seeking full-time employment directly after leaving secondary school is not a feasible option for most students because participation in education is compulsory until age 18 in most German *Länder*.

[5] In addition, the sector of prevocational training measures, called the "transitional system," provides training for those entering neither firm-based training nor school-based training. The various prevocational programs are mainly designed to prepare for regular education, i.e. do not result in occupational credentials, and are often of rather short duration (1 year).

[6] However, enrolment in higher education has been increasing considerable in recent decades accompanied by slightly decreasing participation VET (e.g. BIBB 2018: 57).

often enter apprenticeships than women (BIBB 2018: 56) and there are considerable gender differences in occupations and sectors (BIBB 2018: 33; for gender differences in access and careers see Beicht and Walden 2014).

School-based training is less common than dual training. In 2017, entrants to school-based training amount to 31 percent of all VET entrants (BIBB 2018: 55). These training programs are less regulated compared to the dual system. In most cases, no salary is provided for participants (in contrast to apprentices that are considered as employees) and it is considered to be less professionalised (Haasler and Gottschall 2015). Vocational schools provide training mainly for intermediate-level, white-collar, predominantly female-typical occupations, such as social work and healthcare, nursing, kindergarten teaching, and medical assisting. Hence, gender segregation in VET in Germany is institutionalised by different occupations offered in different types of training. 38 percent of all new entrants in dual training in 2017 are female (BIBB 2018: 17) whereas women are overrepresented in school-based training qualifying for typical female occupations in health care, education and social welfare (cf. Haasler and Gottschall 2015).

2.2.2 VET and Spatial Opportunity Structure

The availability of training places, combined with competition among school leavers, affects an adolescent's chances of obtaining an apprenticeship in the aspired occupation (Kleinert, Vosseler, and Blien 2017). Kalisch (2011) could show, with the example of VET for micro-technologists, that regional disparities are multi-dimensional: an economically-structural dimension is one beside others e.g. educational policy and cultural-historical dimensions. The relevance of regional disparities in German VET has already been addressed by regional studies in the 1990s (e.g. Kutscha 1998). Also, the description of the most recent BIBB report (BIBB 2018: 84) differentiates between regions with over-supply of applicants, regions with too few applicants and those in which no equilibrium occurs due to mismatch of applicants and training places.

Weßling, Hartung, and Hillmert (2015) examine school leavers' transitions into VET showing that unemployment rates within the adolescent's home-district affect the probability of transition from school to apprenticeship. A recent study by Hillmert, Hartung, and Weßling (2017) also shows important spatial variation in transition probabilities to dual VET. They examine district-level (long-term) unemployment and the age-specific population, both affecting individual's chance to enter training. Another study in German-speaking

Switzerland also demonstrates the relevance of the regional opportunity structure for educational attainment net of individual resources and institutional restrictions (Glauser and R. Becker 2016).

So far, there is only limited empirical research on the association between local opportunity structures and occupational aspirations. Looking at prestige levels of occupational aspirations, the results of Wicht and Ludwig-Mayerhofer (2014) indicate that the neighbourhood's class composition (weakly) leads to higher occupational aspirations in advantaged neighbourhoods. Hirschi (2010) showed for Switzerland that the vast majority (82 percent) of students in seventh grade (age 13-15 years) named at least one career aspiration that aligned with real vacancies for vocational apprenticeships in that particular vocation within the Canton (State) of residence.

Gender-type of occupational aspirations is mentioned by Vondracek et al. (1999) only. They examine the occupational aspirations of 10 to 13-year-olds differentiating West and East Germany as regional units. They find an unexpected strong preference of East German boys for public employment, which is a classic domain of women. The authors attribute this finding to the high number of vacancies and high job security of employees in the public sector.

Hence, there is at least some empirical evidence for an association between occupational aspirations and the surrounding VET and labour market conditions. However, none of these previous studies provide a systematic theoretical account of such a relation, nor do they provide an empirical investigation of local VET and labour market structures for the occupational aspirations of young adults.

2.3 Opportunities, Constraints and Occupational Aspirations

Theories on the development of career interests and choices in adolescents concentrate on individual-level influences such as cognitive and mental ability, vocational interests, and expectations resp. preferences for later working careers. In addition, many theories on occupational aspirations integrate parental and peer influences by e.g. socialization processes and provision of resources. However, in most theoretical approaches influences of wider environmental factors are not taken into account. For example, Holland's theory of vocational interests combines individual interests and occupational characteristics but does not explicitly consider external constraints for the realisation of aspirations (Holland 1997). Other standard theories on occupational aspirations such as the Career Development Theory (Super 1957)

and its later extensions by e.g. Savickas (1997) refer to career adaptability assuming that in the course of clarifying vocational identities, individuals compare occupational preferences to the opportunity structure. Here, the perceived opportunity structure mainly consists of e.g. personal career networks or barriers due to expected discrimination (Savickas 1997), but has not been modelled as actual availability of occupational positions. The Social Cognitive Career Theory (Lent, Brown, and Hackett 1994) also considers contextual influences such as supportive environments or limited economic or educational opportunities, but these potential facilitators and limitations remain vague and do not link e.g. occupational aspirations to spatial opportunities. Gottfredson's Theory of Circumscription and Compromise provides the most elaborated approach regarding how opportunity structures - defined as concrete realisation chances and barriers – may influence and change occupational aspirations. We explain this approach more detailed in the next section to derive our hypotheses.

2.3.1 The Role of Spatial Opportunities and Constraints for Occupational Aspirations

In line with previous theories we assume that individual occupational aspirations result from a long-term developmental process taking into account (perceived) opportunities and constraints. Hence, before entering VET, adolescents may have adapted their occupational preferences to given opportunities (e.g. quantity of apprenticeships, available jobs in the respective category) and to expected barriers (e.g. competition with other school leavers). Gottfredson's Theory of Circumscription and Compromise provides a starting point for investigating how such contextual conditions may affect adolescents' occupational aspirations (Gottfredson 1981, 2002). Gottfredson argues that children construct occupational aspirations by first identifying a "zone of acceptable alternatives". This zone of acceptable alternatives is based on the assessment of the compatibility of occupational images (which include the occupations' sex-type and prestige) and is linked to children's own (occupational) self-concept, which is built on, for example, gender, social class background, and vocational interests. From this broad zone of acceptable alternatives, occupational preferences are identified. In a third step, these preferences are adjusted according to perceived accessibility. Accessibility refers to opportunities and obstacles that are expected to affect one's chances of getting into that particular occupation (cf. Gottfredson 1981: 548). To evaluate the accessibility of occupations, Gottfredson lists, among other factors, "the availability of the jobs within the surrounding geographic area, (...), the ease of obtaining training for the job"

(1981: 548). Weighting preferences against accessibility results in the so-called "final realistic occupational aspiration [...] the single occupation named as one's best alternative at any given time" (Gottfredson 1981: 548).

Following these theoretical considerations, we assume that adolescents approaching school graduation develop 'final' realistic occupational aspirations by evaluating their preferences against given opportunities and constraints. The local VET and labour market may present such external opportunities and constraints, which are reflected in the final realistic occupational aspiration. Furthermore, the gender-type of the occupation might also be an important dimension of occupational aspirations susceptible to adaptations and adjustments. Sex-type-boundaries are crossed if young adults face severe constraints for realizing the preferred gender-typical aspired occupation.

2.3.2 Hypotheses

We assume that gender-typical aspirations are observed more often when the opportunity structure allows their accessibility and realisation; such aspirations are observed less often in less favourable conditions. For example, boys who observe a sufficient amount of opportunities in male-dominated occupations will be less likely to enter female-dominated occupations, whereas in a scarcity of male-dominated jobs, boys are more likely to consider female-typical occupations. Hence, the more opportunities available in gender-typical occupations, the more we expect stronger gender congruence of young adults' aspired occupations (Hypothesis 1).

However, scarcity of available occupations in the labour market may affect boys and girls differently. According to Gottfredson, the "sextype threshold is more relaxed for women than for men, because [...] women currently are more willing to perform cross-sextyped work than men" (Gottfredson 2002: 106). Hence, the association of local opportunities and gender-type of occupational aspiration is expected to be more pronounced for boys than for girls (Hypothesis 2).

Next to the availability of apprenticeships and jobs, perceived constraints are assumed to have an effect on occupational aspirations. One possible constraint is competition in the local VET and labour market. One's chances of entering the preferred (gender-typical) occupation may depend on the overall conditions in the local VET and labour market, e.g., the share of school leavers in the residential population, the number of large firms offering apprenticeships, or the unemployment rate. If competition is low, sextype-boundaries do not have to be crossed, and

young adults are more likely to express a gender typical aspiration compared to highly competitive contexts that require more adjustment. Hence, we expect gender-typical occupational aspirations to occur more often in less competitive markets and gender-atypical aspirations to occur more often in more competitive markets (Hypothesis 3a). On the other hand, high competition may also cause young adults to refrain from having a gender atypical preference if they fear the employer's favouritism will result in discrimination. In this case, gender atypical preferences may adapt to gender-typical aspirations (Hypothesis 3b).

In addition, a dense situation in the local VET market may lead girls, especially, to opt for gender-typical occupations, which are more often provided in vocational schools in which access is less market-driven. Therefore, we expect women, to be less likely to opt for a gender atypical occupation if the local VET market is competitive (Hypothesis 4).

In addition to the 'main effects' of occupational opportunities and local competition, it might be reasonable to expect an interaction of both. If there is low competition, there may be sufficient possibilities to realize individual aspirations, even in those occupations that are less available in the region. And vice versa, if there is high competition, it may be too risky to opt for a gender-atypical occupation, even if the occupational structure of the local VET and of the labour market offer more positions in gender-atypical occupations. Thus, our last hypothesis is: If the local market is competitive, the relationship between occupational opportunity structure and gender-type of occupational aspiration will be stronger than in markets with low competition (Hypothesis 5).

2.4 Data, Variables and Methods

2.4.1 Data

To test our hypotheses, we use data from the German National Educational Panel Study (NEPS), starting cohort 4, wave 1 (fall 2010), which is based on youth in grade 9 (Hans-Peter Blossfeld, Roßbach, and von Maurice 2011). The data contain information on students' occupational aspirations, competencies and grades, family background and socio-economic status.

In our analyses, we include students from lower and medium secondary schools as well as mixed-track schools, as these individuals are the main target group of non-academic vocational training in Germany. High school students (attending Gymnasium in 9th grade) are excluded, as most of them continue to upper secondary school (cf. Hillmert and Jacob 2010;

Spangenberg and Quast 2016: 15 -- approximately 80 percent of school leavers with Abitur in 2010 enrolled within 4.5 years). Furthermore, these students have a disproportionately high number of missing values on occupational aspirations, as they have to decide on their aspired occupation at a later point in time. This leaves us with 2266 boys and 2207 girls in our sample.

2.4.2 Variables

Dependent Variable: Gender-type of Occupational Aspiration

Regarding occupational aspirations, respondents were asked the following: "Consider everything you know right now: What will probably be your occupation in the future?" We assume that the answer to that question is as close as possible to Gottfredson's theoretical concept of a "realistic occupational aspiration" that has already been subjected to the process of adjustment and adaptation against available opportunities and constraints.

To classify the gender type of occupational aspirations, we use the share of female employees within each occupation as categorised in the German classification of occupations (KldB2010) using the German Microzensus. We set the cutting point to '70 percent and more' to define female respective male occupations, 'over 30 to less than 70' to define mixed occupations, and '30 and below' to define male respective female occupations. Lower and higher cutting points have been used in robustness checks[7]. However, we also make use of the dichotomised answers: 'female-typical realistic aspiration' vs. 'non-female-typical realistic aspiration' and 'male-typical aspiration' vs. 'non-male-typical realistic aspiration' as dependent variables.

Based on our classification, 20 occupations of the KldB2010 are female-typical and contain approximately 12.000.000 employees; the mixed category contains 55 occupations in which approximately 14.000.000 individuals are employed, and 66 occupations with approximately 14.000.000 employees are male-typical due to this classification. Therefore, female occupations are less differentiated in the KldB2010 but cover a similar number of employees.

In our sample, most girls and boys express gender-typical occupational aspirations, with boys being slightly more gender-conforming than girls (62.7 percent vs. 58.4 percent). On the other hand, girls are less open to male occupations than boys are to female occupations, as 8.2

[7] With a stricter cutting point of, for example, 80 percent, there are too few cases, and with a lower cutting point, such as 60 percent, occupations that have a nearly balanced gender ratio are also defined as female/male.

percent of the girls and 11.4 percent of the boys express a gender-atypical occupational aspiration (Table 2.1). Subsequently, girls more often aspire to mixed occupations than boys.

Table 2.1 Gender-type of Realistic Occupational Aspiration by Gender, in Percent

Gender-type of occupational aspiration	Girls	Boys	Total
*male	8.2	62.7	36.2
*mixed	33.4	26.0	29.6
*female	58.4	11.4	34.3
Total	100	100	100

Note: Data weighted by analytical weights for students participating in fall 2010 provided by the NEPS
Data: NEPS (doi:10.5157/NEPS:SC4:1.1.0); own calculations.

Independent Variables: Local VET and Labour Market

We operationalise opportunities differently for the local VET market and the local labour market. For the VET market, we use the number of vacant training places as well as the share of apprenticeships in female respective male occupations provided by the Federal Labour Office[8] (share of female/male training positions). For realisation opportunities in the labour market, percentages of employees in female and male occupations on the level of districts enter the regression models as metric variables, also provided by the Federal Labour Office (share of female/male jobs in district).

We modulate constraints by using a typology of local VET markets developed by the Institute for Employment Research (IAB) (Kleinert, Vosseler, and Blien 2017). The original typology is based on 6 indicators that have been shown to influence transitions into firm-based VET: the share of large companies with more than 250 employees, the share of school leavers in the residential population, the share of companies that take on trainees, the unemployment rate, the share of large companies within the companies that take on trainees, and finally the share of high school leavers. We aggregated the IAB VET Market typology into three categories (low, moderate and high) according to the extent of competition in the VET market (see Appendix 2.1). Districts with low competition are always used as the reference group.

Control Variables

We control for a wide array of individual level characteristics, including respondents' competencies and vocational interests. Competencies are proxied by self-assessment of school achievement in German and maths (dummy variables), as well as results of competency-tests (for more detailed information on mathematical competencies see Duchhardt and Gerdes

[8] The share refers to employees subject to social insurance contributions only, not including civil servants or self-employed.

2013, and Haberkorn et al. 2012 for reading competencies). Respondents' vocational interests are represented by the weighted sum of scores using items that measure general and vocational interests based on the "Interest Inventory Life Span" (IILS, cf. Holland 1997)[9]. As indicators of respondents' social background, we use the gender-type of the mother's and father's occupations as well as parental social class measured by the highest ISEI of the parents. Information on these are obtained from the parents' questionnaire and complemented with information from the students' questionnaire, if missing[10]. Additionally, we control for type of school, location of school in West or former East Germany, and whether a student was born in Germany or in any other country.

2.4.3 Methods

In the multivariate analyses, we apply multi-level logistic regression to model the dichotomized dependent variables of female vs. non-female and male vs. non-male occupational aspirations, taking into account the hierarchical data structure. Using this estimation technique, we can account for statistical dependencies between observations of the same context through a more complex random term (Hox 2010). We distinguish two levels: On level 1 we look at students; these are nested in districts, which in turn represent level 2. We report average marginal effects (AME) for the fixed estimates to obtain better comparability of results between the models (cf. Mood 2010). For robustness checks, we also estimated linear probability models (LPM) as well as logit, probit and multi-level probit regressions that did not lead to substantively different results (available on request).

2.5 Results

The multivariate results from our multi-level logistic regressions will be reported separately for boys and girls. For both groups, four models are presented: Models F_VET and F_LM show the effects of the share of female training positions/the share of female jobs in the district on aspirations to a female occupation; Models M_VET and M_LM represent the effects of the share of male training positions/the share of male jobs in the district on aspirations to a male occupation.

[9] The IILS distinguishes six (vocational) interests: realistic, investigative, artistic, social, enterprising, and conventional, which are, in each case, measured via the mean of three items.

[10] Mother's and father's occupation are clustered into female (>=70 percent of female employees), mixed (30 up to below 70 percent female employees) and male (less than 30 percent female employees) occupations. We also defined a category for "not employed" and a missing category to avoid dropping too many observations and thus compromising the analysis of the contextual variables that are our main interest here.

Thus, models denoted with "F_" refer to a female-typical occupational aspiration, while "M_" stands for a male-typical occupational aspiration. Models denoted with "_VET" contain the contextual variables pertaining to the occupational structure of apprenticeship offers, while "_LM" signifies that the models contain the explanatory variables pertaining to the occupational structure of the local labour market.

2.5.1 Boys' Occupational Aspirations in Context

The results for the influence of local context on the realistic job aspirations of boys (for male or female occupations) are shown in Table 2.2. We observe no effect of the total number of available training positions on the gender-type of boys' occupational aspirations. Positive but non-significant effects occur for the shares of female and male training offers. This finding means that boys seem to be more likely to aspire to male or female occupations if there are sufficient opportunities in the local labour market. In addition to the main effects, all models contain an interaction between opportunities and competition. Thus, the main effects reflect only the effect of opportunities or competition in the respective reference category (low competition or low number of opportunities). For example, the coefficient for the share of female training positions refers only to districts with low competition. For the interpretation of the effect of available training positions in moderately or highly competitive districts, one has to sum up the main effect plus the respective interaction effect. Thus, in Model F_VET, the effect of more training positions on the female-typical job aspirations of boys in moderately competitive districts would be 0.005 + (-0.005) = 0.000 and thus no longer existent. However, in the two models containing local labour market opportunities as explanatory variables, the significant main effects in districts with low competition – 0.007 for a female-typical aspiration and 0.008 for a male-typical aspiration – are smaller than in highly competitive districts. In moderately competitive districts, the effect of more opportunities in male occupations turns significantly negative in the last model (M_LM). This last result indicates that boys have less gender-congruent aspirations in competitive districts.

Regarding competition, the results for boys' occupational aspirations are weak as well, but they do point in one direction. If the local VET market is competitive, there is a tendency for boys to be more open to female occupations. However, the effect is only significant in the first model (F_VET), for moderate competition. Boys in districts with moderate competition are more likely to aspire to female occupations than boys in districts with low competition.

Table 2.2 Contextual Influences on the Gender-type of Boy's Occupational Aspirations

	F_VET	M_VET	F_LM	M_LM
Number of notified training positions	-0.002	-0.000		
	(0.007)	(0.009)		
Share of female training positions	0.005			
	(0.003)			
Interaction share of female training positions * competition (Ref. Low)				
#share of female training positions*high competition	-0.005			
	(0.004)			
#share of female training positions*moderate competition	-0.006			
	(0.004)			
Share of male training positions		0.003		
		(0.004)		
Interaction share of male training positions * competition (Ref. Low)				
#share of male training positions*high competition		-0.001		
		(0.004)		
#share of male training positions*moderate competition		-0.002		
		(0.004)		
Share of female jobs in district			0.007+	
			(0.004)	
Interaction share of female jobs * competition (Ref. Low)				
#share of female jobs*high competition			-0.002	
			(0.005)	
#share of female jobs*moderate competition			-0.007	
			(0.005)	
Share of male jobs in district				0.008+
				(0.005)
Interaction share of male jobs * competition (Ref. Low)				
#share of male jobs*high competition				-0.004
				(0.005)
#share of male jobs*moderate competition				-0.010+
				(0.005)
Competition (Ref. Low)				
#High Competition	0.083	0.000	0.026	0.022
	(0.052)	(0.079)	(0.056)	(0.080)
#Moderate Competition	0.097+	0.007	0.121	0.109
	(0.056)	(0.076)	(0.074)	(0.071)
N	2266	2266	2266	2266
aic	1453.68	2496.23	1446.90	2488.37
bic	1636.90	2685.18	1624.40	2665.87

Note: + p≤0.1; * p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001; 2-Level Logistic Regression, Average marginal effects for fixed parts/Standard errors in brackets, for the full-model see appendix 2.2
Data: NEPS 2010 (doi:10.5157/NEPS:SC4:1.1.0); own calculations.

Overall, the results for boys tend to be consistent with our expectations, albeit only a few effects are statistically significant. In districts with low competition, boys are more likely to aspire to gender typical or atypical occupations if these offer more opportunities in the local district. However, boys seem to be more aware of the labour market structure than of the structure of local apprenticeship offers. Furthermore, boys' aspirations seem to be less gender-typical and more open to gender-atypical occupations if accessibility is constrained through competition.

2.5.2 Girls' Occupational Aspirations in Context

Table 2.3 presents the results for the occupational aspirations of girls and how they are affected by the local VET and labour markets. The results are remarkably different from those of boys, as girls' aspirations are more reactive to local circumstances. In the first model, when regressing local VET market conditions on girls' aspirations to a female occupation (F_VET), the total number of training positions has a significant negative influence on the gender-typical occupational aspirations of girls: the higher the number of notified training positions within a district, the less likely girls are to aspire to a female occupation. In addition, if there are relatively more apprenticeships available in female occupations, girls are less likely to aspire to such occupations – at least in districts with low competition. Higher competition in the VET market weakens this relation, albeit both interactions of female training positions in moderately and highly competitive VET markets are not significant. Girls' aspirations to female occupations are not altered by competition in the local VET market.

The results of the second model on girls' aspirations to male occupations (M_VET) show that girls' atypical occupational aspirations also respond to local conditions, however, they do so in an unexpected way: if the share of apprenticeships in male occupations rises (in low-competition VET markets), girls' aspiration to such male occupations decrease. However, the interaction with competition again moderates the effect of VET opportunities: In districts with moderate competition, an increasing share of male apprenticeships increases girls' openness to male occupations. In other words, if there are few apprenticeships offered in male occupations in a competitive market, girls refrain from aspiring to a male occupation.

Only model 3 – which estimates the influence of local labour market conditions on girls' aspirations to female occupations (F_LM) – shows the expected results. Under high competition, girls are more likely to aspire to gender-typical occupations. While in low-competitive districts, the share of female jobs is negatively associated with girls' gender-typical job aspirations; this effect turns positive in moderately and highly competitive districts. However, in districts with a low share of female jobs, strong competition decreases the likelihood that girls aspire to female occupations. Finally, the results for girls aspiring to a male occupation (M_LM) indicate that these aspirations are less affected by local opportunities in male occupations. Only under competition, opportunities in male occupations increase girls' openness to gender-atypical occupations.

Table 2.3 Contextual influences on the Gender-type of Girl's Occupational Aspirations

	F_VET	M_VET	F_LM	M_LM
Number of notified training positions	-0.018+	0.003		
	(0.011)	(0.006)		
Share of female training positions	-0.010+			
	(0.006)			
Interaction share of female training positions * competition (Ref. Low)				
#share of female training positions*high competition	0.010			
	(0.007)			
#share of female training positions*moderate competition	0.007			
	(0.007)			
Share of male training positions		-0.004*		
		(0.002)		
Interaction share of male training positions * competition (Ref. Low)				
#share of male training positions*high competition		0.004		
		(0.002)		
#share of male training positions*moderate competition		0.005*		
		(0.002)		
Share of female jobs in district			-0.011+	
			(0.006)	
Interaction share of female jobs * competition (Ref. Low)				
#share of female jobs*high competition			0.021**	
			(0.007)	
#share of female jobs*moderate competition			0.012+	
			(0.007)	
Share of male jobs in district				-0.003
				(0.003)
Interaction share of male jobs * competition (Ref. Low)				
#share of male jobs*high competition				0.003
				(0.003)
#share of male jobs*moderate competition				0.005+
				(0.003)
Competition (Ref. Low)				
#High Competition	-0.155	-0.077	-0.246**	-0.056
	(0.103)	(0.070)	(0.084)	(0.068)
#Moderate Competition	-0.123	-0.109+	-0.143	-0.091
	(0.103)	(0.065)	(0.091)	(0.061)
N	2207	2207	2207	2207
aic	2533.50	1078.10	2527.96	1078.25
bic	2721.58	1260.48	2710.34	1254.93

Note: + p≤0.1; * p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001; 2-Level Logistic Regression, Average marginal effects for fixed parts/Standard errors in brackets, for the full model see appendix 2.3
Data: NEPS 2010 (doi:10.5157/NEPS:SC4:1.1.0); own calculations.

Summarizing the results for girls' occupational aspirations, in low-competitive districts, a higher share of male or respective female jobs, leads to a lower probability that girls aspire to these occupations. However, all interaction effects are positive and thus moderate or high competition levels the negative effect of opportunity structure in low-competition districts. Also, in districts with few opportunities for realisation, competition decreases the probability of a female or male occupation. Subsequently, opportunities, as well as constraints, seem to promote gender-neutral occupational aspirations. However, in models M_VET and F_LM, the significant interaction effect leads to a significant change of sign, meaning that girls tend to

orient their aspirations towards opportunities if competition is moderate or high. This observation may be explained by results of experimental studies that prove a higher competition aversion among girls in comparison to boys (e.g. Niederle and Vesterlung 2011). That girls' occupational aspirations are only gender congruent under competition may indicate that girls are aware of lower wages and career prospects in female occupations.

2.6 Discussion

Applying theories of the development and adjustment of adolescent's occupational aspirations to contextual conditions, this study examines the influence of accessibility of vocational education and training (VET) and later labour market opportunities on the expression of 'realistic' occupational aspirations shortly before leaving school. The German case is of special interest for this analysis because we observe rather high gender segregation in the VET and labour markets, as well as low occupational mobility in individuals' later working lives. As the eventual labour market opportunities of adolescents opting for non-academic vocational training are mostly affected by their initial occupational aspirations, we focus particularly on this group. Using data from the NEPS, starting cohort 4, we show that boys' and girls' aspirations are indeed affected by their local contexts, even if influences at the individual level are much more important.

Theoretically, we assumed that occupational preferences are adjusted taking into account opportunities and constraints, resulting in occupational aspirations. Furthermore, sex-type of occupational aspirations is expected to be affected by local conditions. The overall distribution of gendered aspirations of boys and girls shows that boys' aspirations are more gender-typical, but boys are also more open to gender-atypical occupations than girls. Multivariate results indicate that boys are even more flexible to cross sex-type boundaries if accessibility is constrained through competition. In general, our results for boys' realistic occupational aspirations tend to be consistent with expectations. However, only a few effects are statistically significant. Boys are more likely to aspire to occupations that offer more opportunities in the local context, at least in low-competition districts. The comparison of the different indicators shows that boys seem to be more perceptive of the labour market structure than to of structure of local apprenticeship offers.

For girls, the results are different: At least in low-competition districts, they tend to aspire neither to gender-typical nor to gender-atypical occupations; thus, they seem to prefer mixed occupations. However, under competition, they take into account the opportunity structures of

the VET and labour markets and are more open to both female and male occupations. That girls' occupational aspirations are only gender congruent under competition may indicate that girls are aware of the lower wages and career prospects in gender-typical occupations and that they also shy away from competition.

The general conclusion from our results is that girls and boys are affected by their local context. They do take into account short-term as well as long-term opportunities to realize their occupational aspirations. This is in line with previous research, which has shown that accessibility and expected job security are already important for adolescents.

Limitations of this analysis are, for example, the absence of proper measurements regarding personal attitudes, e.g., career orientation and the influence of significant others apart from parents (peers and teachers), which might influence occupational aspirations as well. The NEPS data offer some information on both aspects but suffer from missing values, so it was not possible to include all presumably important aspects simultaneously. Therefore, further research is needed. On the macro-spatial level, our paper is limited to the contextual information that we could merge to the NEPS data and were suitable for our analyses. Several other contextual conditions might be relevant for the formation of aspirations. For example, generalizing Correll's findings on the importance of (cultural) gender beliefs for career-decisions (Correll 2001, 2004), it seems likely that more traditional gender beliefs in adolescent's environment affect occupational aspirations. These and other contextual factors have to be examined in further research.

Our research question of the relevance of spatial externalities on occupational aspiration is not limited to Germany. The formation of gendered occupational aspirations has been subject to numerous studies in many countries, most of them applying a supply-oriented perspective on individual factors. We add to this strand of research that gendered occupational aspirations may vary between contexts. The described theoretical processes of adolescent's adapting aspirations to the local availability and competition for occupations are transferable to other countries and to processes of labour market entry; whether and which local conditions increase or decrease segregation then remains an empirical question. In addition, as many political interventions are designed to change adolescent's (unconstrained) perception of gender–(a-)typical jobs (e.g. girls' and boys' days and gender quotas in boardrooms) our results may inform these policies to pay attention to the local labour market structure. Regarding the development of new occupations in the course of digitalization it remains an

open question how gender boundaries of old resp. new occupations develop and gender differences at subsequent labour market entry change (cf. Jacob, Kleinert, and Kühhirt 2013).

Even though we are able to demonstrate the importance of local context for individual's occupational aspirations, deeper theoretical arguments on the macro-micro-link and its mechanisms have to be developed further. Thus, further research is needed to investigate the underlying mechanisms. How do adolescents take note of their surrounding opportunities and constraints? Are there thresholds affecting the influence of opportunities and constraints on the adaptation of occupational aspirations? To investigate the underlying mechanisms, the use of vignette studies or experiments would be particularly promising.

Acknowledgements

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Appendix

Appendix 2.1 Typology of VET Market According to Kleinert, Vosseler, and Blien (2017) and Aggregation into Competition Categories

Values of classification variables in the training market types 2010		Competition
I: Eastern German districts with very few school leavers and high unemployment		
Type Ia:	Rural districts with large secondary sector	Moderate
Type Ib:	Rural districts with average training market conditions	Moderate
Type Ic:	Differing districts with favourable training market conditions	Low
Type II: Dynamic metropolitan areas in the West		
Type IIa:	Metropolitan districts with favourable training market conditions and low competition	Low
Type IIb:	Urban districts with strong large-establishment neighbourhood	Low
Type III: Western districts with large- establishment neighbourhoods		
Type IIIa:	Urban districts with average conditions	Moderate
Type IIIb:	Rather urban districts with very low unemployment and high competition	High
Type IIIc:	Metropolitan districts with high unemployment	Low
Type IV: Western districts with no large- establishment neighbourhood and low unemployment		
Type IVa:	Rather urban districts favourable training market conditions and medium competition	Moderate
Type IVb:	Rural districts with large secondary sector and high competition	High
Type IVc:	Rural districts with very weak large- establishment neighbourhood and high competition	High

Appendix 2.2 Full Model for Boys

	F_VET	M_VET	F_LM	M_LM
Number of notified training positions	-0.002	-0.000		
	(0.007)	(0.009)		
Share of female training positions	0.005			
	(0.003)			
Interaction share of female training positions * competition (Ref. Low)				
#share of female training positions*high competition	-0.005			
	(0.004)			
#share of female training positions*moderate competition	-0.006			
	(0.004)			
Share of male training positions		0.003		
		(0.004)		
Interaction share of male training positions * competition (Ref. Low)				
#share of male training positions*high competition		-0.001		
		(0.004)		
#share of male training positions*moderate competition		-0.002		
		(0.004)		
Share of female jobs in district			0.007+	
			(0.004)	
Interaction share of female jobs * competition (Ref. Low)				
#share of female jobs*high competition			-0.002	
			(0.005)	
#share of female jobs*moderate competition			-0.007	
			(0.005)	
Share of male jobs in district				0.008+
				(0.005)
Interaction share of male jobs * competition (Ref. Low)				
#share of male jobs*high competition				-0.004
				(0.005)
#share of male jobs*moderate competition				-0.010+
				(0.005)
Competition (Ref. Low)				
#High Competition	0.083	-0.000	0.026	0.022
	(0.052)	(0.079)	(0.056)	(0.080)
#Moderate Competition	0.097+	0.007	0.121	0.109
	(0.056)	(0.076)	(0.074)	(0.071)
Father's Occupation (Ref. Male Occupation)				
#not employed	0.066	-0.072	0.067	-0.066
	(0.055)	(0.067)	(0.055)	(0.067)
#mixed	-0.003	-0.105***	-0.004	-0.105***
	(0.016)	(0.024)	(0.016)	(0.024)
#female	0.105**	-0.102*	0.107**	-0.103*
	(0.033)	(0.040)	(0.033)	(0.040)
#Missing	-0.006	-0.022	-0.008	-0.021
	(0.018)	(0.027)	(0.018)	(0.027)
Mother's Occupation (Ref. Male Occupation)				
#not employed	0.023	-0.016	0.025	-0.014
	(0.034)	(0.049)	(0.034)	(0.049)
#mixed	0.011	-0.051	0.014	-0.051
	(0.030)	(0.044)	(0.030)	(0.044)
#female	0.024	-0.035	0.024	-0.035
	(0.028)	(0.041)	(0.027)	(0.041)
#Missing	0.044	-0.028	0.045	-0.028
	(0.030)	(0.043)	(0.030)	(0.043)

To be continued on following page...

...continuation	F_VET	M_VET	F_LM	M_LM
ISEI parents	-0.001	-0.000	-0.001	-0.000
	(0.000)	(0.001)	(0.000)	(0.001)
IILS-R: Practical-technical interests	-0.070***	0.173***	-0.070***	0.173***
	(0.007)	(0.008)	(0.007)	(0.008)
IILS-I: Intellectual-researching interests	-0.004	-0.005	-0.002	-0.005
	(0.008)	(0.011)	(0.008)	(0.011)
IILS-A: Artistic-language interests	0.011	-0.084***	0.010	-0.084***
	(0.008)	(0.011)	(0.008)	(0.011)
IILS-S: Social interests	0.057***	-0.032**	0.057***	-0.032**
	(0.008)	(0.012)	(0.008)	(0.012)
IILS-E: Entrepreneurial interests	-0.021*	-0.006	-0.021*	-0.006
	(0.009)	(0.013)	(0.009)	(0.013)
IILS-C: Conventional interests	0.017*	-0.050***	0.017*	-0.050***
	(0.009)	(0.012)	(0.009)	(0.012)
Good grades in German	0.016	-0.050**	0.015	-0.048*
	(0.014)	(0.019)	(0.014)	(0.019)
Good grades in maths	-0.019	0.028	-0.020	0.027
	(0.014)	(0.021)	(0.014)	(0.021)
Reading competence	-0.001	-0.013	-0.001	-0.013
	(0.007)	(0.010)	(0.007)	(0.010)
Mathematical competence	-0.002	-0.017	-0.001	-0.018
	(0.008)	(0.012)	(0.008)	(0.011)
Natural science competence	-0.000	0.014	-0.001	0.012
	(0.010)	(0.014)	(0.010)	(0.014)
School type (Ref. "Hauptschule")				
#School with several courses	0.006	-0.021	-0.006	-0.027
	(0.037)	(0.049)	(0.034)	(0.047)
#Realschule	-0.024	-0.049*	-0.026	-0.044+
	(0.016)	(0.023)	(0.017)	(0.023)
#Comprehensive school	-0.043*	-0.035	-0.052**	-0.034
	(0.019)	(0.030)	(0.019)	(0.030)
Born in Germany	-0.019	0.090*	-0.019	0.091*
	(0.026)	(0.040)	(0.026)	(0.040)
East Germany	-0.016	-0.006	-0.009	0.017
	(0.033)	(0.047)	(0.032)	(0.046)
_cons	-2.020*	-0.349	-2.302*	-0.651
	(1.011)	(0.561)	(0.938)	(0.529)
var(_cons[kreis_cluste~)				
_cons	0.000	0.017	0.000	0.000
	(0.000)	(0.044)	(0.000)	(0.000)
N	2266	2266	2266	2266
aic	1453.68	2496.23	1446.90	2488.37
bic	1636.90	2685.18	1624.40	2665.87

Note: + p≤0.1; * p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001 / AMEs for fixed parts/Standard errors in brackets
Data: NEPS 2010 (doi:10.5157/NEPS:SC4:1.1.0), own calculations

Appendix 2.3 Full Model for Girls

	F_VET	M_VET	F_LM	M_LM
Number of notified training positions	-0.018+	0.003		
	(0.011)	(0.006)		
Share of female training positions	-0.010+			
	(0.006)			
Interaction share of female training positions * competition (Ref. Low)				
#share of female training positions*high competition	0.010			
	(0.007)			
#share of female training positions*moderate competition	0.007			
	(0.007)			
Share of male training positions		-0.004*		
		(0.002)		
Interaction share of male training positions * competition (Ref. Low)				
#share of male training positions*high competition		0.004		
		(0.002)		
#share of male training positions*moderate competition		0.005*		
		(0.002)		
Share of female jobs in district			-0.011+	
			(0.006)	
Interaction share of female jobs * competition (Ref. Low)				
#share of female jobs*high competition			0.021**	
			(0.007)	
#share of female jobs*moderate competition			0.012+	
			(0.007)	
Share of male jobs in district				-0.003
				(0.003)
Interaction share of male jobs * competition (Ref. Low)				
#share of male jobs*high competition				0.003
				(0.003)
#share of male jobs*moderate competition				0.005+
				(0.003)
Competition (Ref. Low)				
#High Competition	-0.155	-0.077	-0.246**	-0.056
	(0.103)	(0.070)	(0.084)	(0.068)
#Moderate Competition	-0.123	-0.109+	-0.143	-0.091
	(0.103)	(0.065)	(0.091)	(0.061)
Father's Occupation (Ref. Male Occupation)				
#not employed	0.141*	-0.056*	0.138*	-0.056*
	(0.062)	(0.023)	(0.062)	(0.023)
#mixed	-0.018	-0.002	-0.022	-0.002
	(0.026)	(0.014)	(0.026)	(0.015)
#female	-0.037	0.023	-0.044	0.024
	(0.039)	(0.025)	(0.039)	(0.025)
#Missing	0.027	-0.018	0.028	-0.019
	(0.028)	(0.015)	(0.027)	(0.015)
Mother's Occupation (Ref. Male Occupation)				
#not employed	0.019	-0.024	0.012	-0.023
	(0.056)	(0.032)	(0.056)	(0.032)
#mixed	0.039	-0.002	0.031	0.001
	(0.052)	(0.030)	(0.051)	(0.030)
#female	0.048	-0.013	0.041	-0.009
	(0.048)	(0.028)	(0.048)	(0.028)
#Missing	0.033	-0.014	0.025	-0.011
	(0.052)	(0.030)	(0.052)	(0.030)

To be continued on following page...

...continuation	F_VET	M_VET	F_LM	M_LM
ISEI parents	-0.002**	0.000	-0.002**	0.000
	(0.001)	(0.000)	(0.001)	(0.000)
IILS-R: Practical-technical interests	-0.067***	0.057***	-0.066***	0.057***
	(0.012)	(0.006)	(0.012)	(0.006)
IILS-I: Intellectual-researching interests	-0.003	-0.003	-0.004	-0.003
	(0.012)	(0.006)	(0.012)	(0.006)
IILS-A: Artistic-language interests	-0.027*	-0.011+	-0.027*	-0.011+
	(0.011)	(0.006)	(0.011)	(0.006)
IILS-S: Social interests	0.150***	-0.029***	0.150***	-0.029***
	(0.009)	(0.006)	(0.009)	(0.006)
IILS-E: Entrepreneurial interests	-0.048***	0.023**	-0.048***	0.023**
	(0.013)	(0.007)	(0.013)	(0.007)
IILS-C: Conventional interests	-0.019	-0.029***	-0.018	-0.029***
	(0.013)	(0.007)	(0.013)	(0.007)
Good grades in German	-0.038	-0.007	-0.037	-0.007
	(0.024)	(0.013)	(0.023)	(0.013)
Good grades in maths	-0.084***	0.017	-0.083***	0.017
	(0.019)	(0.012)	(0.019)	(0.012)
Reading competence	-0.024*	-0.001	-0.022+	-0.001
	(0.012)	(0.007)	(0.012)	(0.007)
Mathematical competence	-0.016	0.003	-0.016	0.002
	(0.014)	(0.008)	(0.014)	(0.008)
Natural science competence	-0.029+	0.010	-0.029+	0.010
	(0.016)	(0.009)	(0.016)	(0.009)
School type (Ref. "Hauptschule")				
#School with several courses	-0.043	0.010	-0.033	0.009
	(0.053)	(0.030)	(0.050)	(0.029)
#Realschule	-0.092***	-0.005	-0.087***	-0.007
	(0.025)	(0.014)	(0.025)	(0.014)
#Comprehensive school	-0.155***	-0.004	-0.156***	-0.006
	(0.032)	(0.017)	(0.032)	(0.017)
Born in Germany	0.042	0.106*	0.043	0.106*
	(0.041)	(0.046)	(0.041)	(0.046)
East Germany	-0.014	0.009	0.013	0.001
	(0.051)	(0.026)	(0.049)	(0.026)
_cons	1.758*	-3.224**	1.312*	-3.380**
	(0.764)	(1.147)	(0.656)	(1.122)
var(_cons[kreis_cluste~)				
_cons	0.076	0.000	0.057	0.000
	(0.056)	(0.000)	(0.053)	(0.000)
N	2207	2207	2207	2207
aic	2533.50	1078.10	2527.96	1078.25
bic	2721.58	1260.48	2710.34	1254.93

Note: + p≤0.1; * p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001 / AMEs for fixed parts/Standard errors in brackets
Data: NEPS 2010 (doi:10.5157/NEPS:SC4:1.1.0), own calculations.

Chapter 3

The Role of Occupational Segregation for Gender-specific Employment Patterns in West Germany

Abstract

Despite increasing educational attainment and greater labour market participation of women in the last decades, occupational segregation and gender differences in employment patterns remain stable. While men continue to have fairly stable employment patterns, women's occupational trajectories are more affected by discontinuity and part-time work. Previous research on gender inequality in labour markets (LM) focused on individual- and macro-level influences on e.g. female labour supply and wages. This study adds to and extends previous research by focussing on men's employment patterns in occupations with different gender-types. Doing so, this analysis contributes to disentangle individual and contextual influences by comparing typical employment patterns of men in female-typical occupations with those of their female colleagues and those of men in male-typical occupations. By this means, the aim of this study is to detect the contribution of occupational settings to gender differentiation in employment patterns. Drawing on data from the German National Educational Panel Study (NEPS), I use sequence clustering to detect different types of employment patterns and following multinomial logistic regressions on cluster membership. The results show that employment patterns differ by gender and type of occupation. The majority of men do have continuous fulltime employment patterns, even in female occupations. However, men in female occupations are significantly more likely to have work interruptions for further education and part-time dominated employment trajectories compared to men in male-typical occupations.

Keywords: Career patterns, employment trajectories, work histories, gender-atypical occupations, sequence analysis, optimal matching, cluster analysis

3.1 Introduction

Although female labour force participation has significantly increased in the last decades, occupational gender segregation as well as substantial differences between men and women regarding typical employment patterns remain stable (e.g. Blau, Brummund, and Liu 2013; Cohen, Huffman, and Knauer 2009; Widmer and Ritschard 2009). Despite a general growth in career complexity, men continue to have fairly stable patterns of LM participation while women's occupational trajectories are more complex, and seem to be increasingly affected by discontinuity and part-time work (Widmer and Ritschard 2009; Jacobs 1999; Biemann, Zacher, and Feldman 2012). Brückner and Karl Ulrich Mayer (2005) further point out that women's and men's life courses are converging with respect to education and labour force participation, while gender differences due to the family formation nexus are persist across cohorts.

However, up to now there is only little research on whether gender differences in employment patterns are also affected by occupational opportunity structures (e.g. Hausmann, Kleinert, and Leuze 2015). The question whether occupation-specific modes of employment can explain gender differences in employment patterns remains open. Investigating men's employment patterns in female occupations, and comparing them to those of women in the same type of occupation and to those of men in male-typical occupations, contributes to a greater understanding of gender differences in employment patterns and related disadvantages. If employment patterns of men and women in female-typical occupations are gender-independent, this would indicate that differences in employment patterns are not gender-driven but caused by occupation-specific opportunity structures for different work arrangements. Conversely, if employment patterns of men in female-typical occupations are more similar to those of men in male-typical occupations; this would indicate that the type of occupation does not matter for gender-differences in work arrangements.

Therefore, the main focus of this paper is to investigate whether different types of employment patterns can be empirically identified and how they vary with respect to gender and gender-type of occupation. More precisely, testing competing explanations of economic and sociological theory, this paper asks: Do employment patterns differ between occupations with different gender composition – independent of gender? Are employment patterns of men in female-typical occupations more similar to those of women in female-typical occupations or to men in male-typical ones?

The dynamics and complexity of employment biographies cannot be analyzed by focusing on specific events or time points. However, the few studies on male employment trajectories over a longer time period do not consider the gender ratio within occupations and do not compare men with their female colleagues (e.g. Simonson, Gordo, and Kelle 2015). Therefore, this study contributes to previous research in several respects: 1) it is the first quantitative study focussing on male employment patterns in female-typical occupations and thus taking into account occupational opportunity structures for different work arrangements; 2) by using a sequence analysis approach it captures the whole complexity of employment trajectories and does not restrict the analysis to a single outcome; 3) furthermore, this study contributes to the discussion on the validity of competing explanations of economics and sociology.

To analyse causes of different employment patterns, West Germany is a very interesting case because it is characterised by strong occupational gender segregation compared to other European countries, low occupational mobility and a high prevalence of gender-specific employment patterns due to traditional gender norms of a male breadwinner and female caregiver (Haasler and Gottschall 2015; Sainsbury 1999). Recent changes in work-family oriented policies cannot be observed within the time of observation covered by this study (Trappe, Pollmann-Schult, and Schmitt 2015). Thus, West Germany offers framework conditions for the most rigorous testing.

Drawing on monthly employment status information from starting cohort 6 of the German National Educational Panel Study (NEPS), I use sequence clustering to reveal different types of employment trajectories. Subsequently, cluster membership is used as dependent variable in multinomial logistic regressions to investigate the explanatory power of gender and gender-type of occupation.

3.2 Theoretical Explanations, Empirical Evidence and Hypotheses

Theoretical approaches that explain different employment patterns between men and women normally argue through division of gainful employment and domestic work. However, the various approaches built on different mechanisms for the distinction of gender-specific employment trajectories. In the following, the competing theoretical approaches of economics and sociology with the most direct explanations for gender-specific employment patterns will be briefly summarized. Previous empirical evidence will be taking into account when formulating the hypotheses.

3.2.1 Self-Selection into Occupations with Different Work Arrangements

Economic theories – for instance human capital theory – assume that educational and occupational decisions are based on cost-benefit calculations that aim at utility maximization. Becker (1993) argues that men and women invest in different forms of human capital due to their differences in biological commitment to the production and care of children. As women invest more physical effort during pregnancy, their interest to ensure optimal care for their offspring should be naturally higher than men's. Married (heterosexual) couples are assumed to be most efficient when women specialise on childcare and other household activities and thus on "human capital that raises household efficiency (...) [while] (...) men invest mainly in capital that raises market efficiency" (Becker 1993: 39). In line with this argument, men are more productive in the LM and thus have higher wages. Therefore, the logical consequence is that men allocate as much time as possible to gainful employment, to feed their families and protect their wives "against abandonment and other adversities" (Becker 1993: 30), while women allocate their time primarily in childcare and other household responsibilities.

Building on these basic assumptions, Polachek (1981) argued that women and men self-select into different occupations due to occupation specific levels of atrophy, "defined as the loss of earnings potential that can be attributed to periods of work intermittency" (Polachek 1981: 62). As women expect to have more intermittent employment trajectories compared to men who aim at permanent and full LM participation, women chose occupations, where interruptions are less costly. However, even Polachek admits the possibility of reverse causality, where choosing an occupation which facilitates times out of labour force lead to more intermittent employment patterns. This limitation also points to the weak assumption that adolescents already plan their LM participation (and family formation including partners employment) over the whole life cycle, when investing in human capital and choosing an occupation.

However, the economic perspective seems to be in line with the developmental history of occupations in West Germany. Many male-dominated occupations emerged or further developed in the course of industrialization, with a strong need for a fully available workforce (Busch 2013b). Therefore, the growth of large firms aligned with the development of internal labour markets to ensure employee retention and to reduce costs of searching for new employees (Sørensen and Kalleberg 1981). Consequently, intermittent employment careers and part-time work was not supported within this context. Contrary, tasks of female-typical occupations such as care giving were formerly organised by women within the households.

The educational expansion, which facilitates access to education for a broader audience – including women, aligned with the development of female niches such as elderly or child care (Krüger 2004). As Krüger (2003) points out, the development of vocational training for women intended to be just a bridge between the end of school and marriage. The skills obtained during that time should prepare women for their later role within the household and at most qualify for secondary employment to improve the household income. Therefore, the aim of reconciliation of work and family obligations was a fundamental requirement for the development of female-typical occupations. Thus, it is assumed that female-typical occupations offer more opportunities for e.g. interruptions and part-time work for both, women and men:

H1: Employment patterns of men in female-typical occupations assimilate to those of their female colleagues.

With regard to employment patterns following occupational choice, economic theory further argues that the real household division of labour during the life course is the result of different bargaining power of men and women based on their productivity and related earnings potential (Lundberg and Pollak 1996). However, if the optimisation of efficiency is the only mechanism for the differentiation of (gendered) employment patterns, it would be also rational that men specialise on housework and women on gainful work if their earnings potentials are reversed. However, previous research shows that this is rarely the case. Even if wives have higher earnings, husbands do not take over a higher share of housework or care responsibilities (e.g. Grunow, Schulz, and Blossfeld 2012). Especially the birth of a child relegates women more to the domestic sphere, which results in work interruptions and/or part-time employment, independent of their relative wages before giving birth (e.g. Kühhirt 2012; Schober 2013). Men's' LM participation seems to be unaffected by their wife's' contribution to the household income and the birth of a child. Thus, Grunow, Schulz, and Blossfeld (2012) draw the conclusion that gender norms appear to be more important for the explanation of gendered employment trajectories than economic rationalities.

3.2.2 Gender Norms, Occupational Choice and Employment Patterns

In contrast to economic approaches, sociologists emphasise the role of cultural gender norms for the explanation of gender-specific educational and occupational decisions and employment patterns. It is assumed that children are born without gender-specific differences, but develop gendered attitudes through the incorporation of societal constructed gender roles,

especially within the nuclear family during childhood, and later on via interactions with their peer groups and wider social contexts (e.g. Parsons and Bales 1955; West and Zimmerman 1987; Stets and Burk 2000; Davis and Greenstein 2009). Traditionally, these gender norms assign the breadwinner role to men, while the family's caregiver and homemaker role is attributed to women. Due to social desirability, men focus on continuous and fulltime employment, while women's employment has to be compatible with their domestic responsibilities. If gender-specific employment patterns are driven by traditional gender norms, the occupational setting should have no influence. Subsequently, the competing second hypotheses is

H2: *Employment patterns of men in female-typical occupations do not differ from those of men in male-typical occupations.*

Recent contributions from socialisation research further developed the concept of a (primary) socialisation within the family, shifting from more or less stable gender norms over the life course to a more dynamic socialisation concept, which emphasises the role of parenthood for the impact of traditional gender norms (Grunow 2013). While especially younger cohorts show egalitarian gender role attitudes and behaviours before entering parenthood, childbirth seem to be the key event, which results in a shift to more traditional gender role attitudes (e.g. Schober 2012; Kühhirt 2012). Reasons for this "re-traditionalisation" due to parenthood are seen in 1) welfare policies which support a traditional division of labour for parents (Bühlmann, Elcheroth, and Tettamanti 2010) and 2) cultural norms of motherhood which had not changed simultaneously or to the same extend as general gender norms (Grunow, Schulz, and Blossfeld 2012). Especially in Western Germany, constraining social policies like the specific taxation of married couples (splitting the difference in spousal income) and the lack of childcare opportunities as well as the "cultural ideals of 'the good mother' who stays home with her children" (Grunow, Hofmeister, and Buchholz 2006: 122), support work interruptions and following part-time work for mothers. Therefore, a further hypothesis for the relevance of parenthood is formulated:

H3: Gender differences in employment patterns, independent of the gender-type of occupation, are mainly observable among parents.

3.3 Data, Analytical Strategy and Variables

3.3.1 Data and Sample

To test the hypotheses developed in the last section, I use data from the NEPS, starting cohort 6 (see Blossfeld, Roßbach, and von Maurice 2011). This longitudinal dataset contains retrospectively collected information on adults' educational and employment biographies of individuals born between 1944 and 1986.

As the gender composition within occupations slightly varies over time, the gender composition within one specific year would be not appropriate for an analysis of long-time employment histories. Thus, I use the mean share of female employees between 2001 and 2011 within each occupation, categorized in the German classification of occupations (KldB1988 – 3 digit), provided by the German labour agency, to distinguish female-, mixed and male-typical occupations. Unfortunately, data of longer periods cannot be compared or put together due to data coding releases. I apply a dichotomous operationalisation of gender composition, instead of a metric measure, because I do not assume a linear relationship. Furthermore, the gender-type of occupation is used to create groups and therefore needs to be categorical from a methodological point of view. Based on the mean share of female employees, occupations with "70 percent and more" are defined as female occupations, "over 30 to less than 70" as mixed occupations, and "30 and below" as male occupations. Lower (35/65 percent) and higher (25/75 percent) cut-off points have been used for robustness checks[11].

As the main gender differences are assumed to enfold during LM entry and family formation processes, this analysis follows individuals from their first significant job for a period of 15 years (180 months). In line with the definition used by Eurostat in the EU-LFS, the first significant job is defined as the first non-marginal job between that lasted at least 6 months as it was used in several studies (e.g. used by Kogan and Unt 2005; Smyth 2005). Jobs in preparation for a career, such as internships, traineeships, preparatory services and jobs as student worker are not considered. I excluded respondents who never had a first significant job or who have missing information for sample-defining characteristics, such as gender or

[11] With a stricter cut-off point of, for example 80 percent, there are too few cases and thus too small within group variance for analysis for e.g. men in female occupations. With a lower cut-off point, such as 60 percent, occupations that have a nearly balanced gender ratio are also defined as gender-typical.

date of birth. The analytical sample consists of 11.262 individual employment biographies, 5.411 of which are female (48%) and 5.851 are male (52%).

3.3.2 Analytical Strategy

The purpose of this study is to analyse employment biographies of men and women in different occupational settings. These biographies are conceptualized as "categorical sequences, [...] represented by an ordered list of successive elements" (Studer and Ritschard 2016). The data contain one sequence per individual, which consists of 180 sequence element (month). Individual sequences with more than 30 percent (54 month) of missing information are deleted from the sample. Each element of these monthly employment histories is defined by one of the following mutually exclusive states (elements): (1) Full-time employment, (2) part-time employment, (3) education, (4) leave for family reasons, and (5) not employed, in education or training (NEET). Gaps of information are coded as further state (6).

To analyse gender-typicality of occupational biographies, I firstly visualise how (un)stable occupational decisions are over the course of observation time using sequence index plots. Following, I use dynamic distance measures for a hierarchical cluster analysis to identify a typology of employment patterns. In a third step, the resulting cluster membership of each individual sequence is used as dependent variable in multinomial logistic regressions.

The analysis of employment trajectories as sequences has the advantage that it takes into account it's full complexity (for more detailed discussion see e.g. Aisenbrey and Fasang 2010). Sequence analysis refers to the calculation of (dis)similarity measures (for further reading on different dissimilarity measures see Studer and Ritschard 2016). The applied measure of dissimilarity in this study is the Dynamic Hamming Distance (DHD) which uses substitution costs derived from transition rates (Lesnard 2010). This dynamic measure has the advantage that more common changes represent lower costs, while rare changes are more costly. Thus, it is possible to take into account that e.g. times off for family reasons have a higher likelihood to occur during family formation time, which is not equally distributed through the 15 years following the first significant job, especially for individuals with different educational attainment (see e.g. Stahl and Schober 2018). The optimal matching algorithm (OM) as alternative distance measure is used for robustness checks.

The distance matrix is the basis for the cluster analysis. Aim of the applied Ward's linkage cluster analysis is to group sequences that are most homogeneous within the groups and most

different between the groups. To determine the appropriate number of clusters, several cut-off criteria are used.

After identifying various types of employment patterns, multinomial logistic regressions explain, how the gender-type of occupation can contribute to predict cluster membership. For this purpose, employment patterns of men in female-typical occupations are compared to those of men in other occupations and to those of women in female-typical occupations. This means, I analyse, if men with employment biographies predominantly in female-typical occupations, are found in the same clusters as their female colleagues or if they group with other men. To further test Hypotheses 3 on the relevance of parenthood, separate models for parents and non-parents are estimated.

3.3.3 Variables

The *dependent variable* for the multinomial logistic regression models is the cluster membership. Independent of gender-type of occupation male-typical employment biographies are expected to be more "stable" over time and thus characterised by continuously full-time employment. Female-typical employment patterns, on the opposite are expected to contain more part-time employment, to be more intermittent and thus more complex.

As the main research interest is to disentangle whether employment patterns are gender- or occupation driven, the main *explanatory variables* for the analysis are gender and the gender-type of occupational biography. The latter is a categorical variable for the most frequent gender-type of occupation most prevalent within the individual employment biography.

In addition to the explanatory variables, various *control variables* are included in the models. It is known for example that the complexity of employment patterns differ by cohort (Simonson, Gordo, and Titova 2011; Simonson, Gordo, and Kelle 2015) a categorical variable for birth cohort (1944 – 1955, 1956 – 1965, 1966 – 1975, 1976 – 1989) is included. Furthermore, the models contain the highest educational degree at time of LM entry and a dummy for a later increase in educational degree; the marital status (if ever married within observation time) and the birth of children during observation time. Additionally, all models contain the age of respondent at LM entry and if the individual is born in West Germany or abroad. Individuals born in East Germany are excluded by sample definition.

3.4 Results

3.4.1 Descriptive Results

To analyze gender differences in employment biographies, I start by looking at the gender-typicality of occupations at LM entry. As it can be seen in Table 3.1, the labour market entry in a gender-typical occupation is a little bit more common among men (62.6 percent) compared to women (58.5 percent). This can probably been attributed to the higher number of male-dominated occupations compared to female-dominated ones. Furthermore, the same is true for the gender-type of occupation predominantly held through the observed employment biography. While about 63 percent of all men in the sample have an employment biography dominated by gender-typical occupations, this is true for 57 percent of the women.

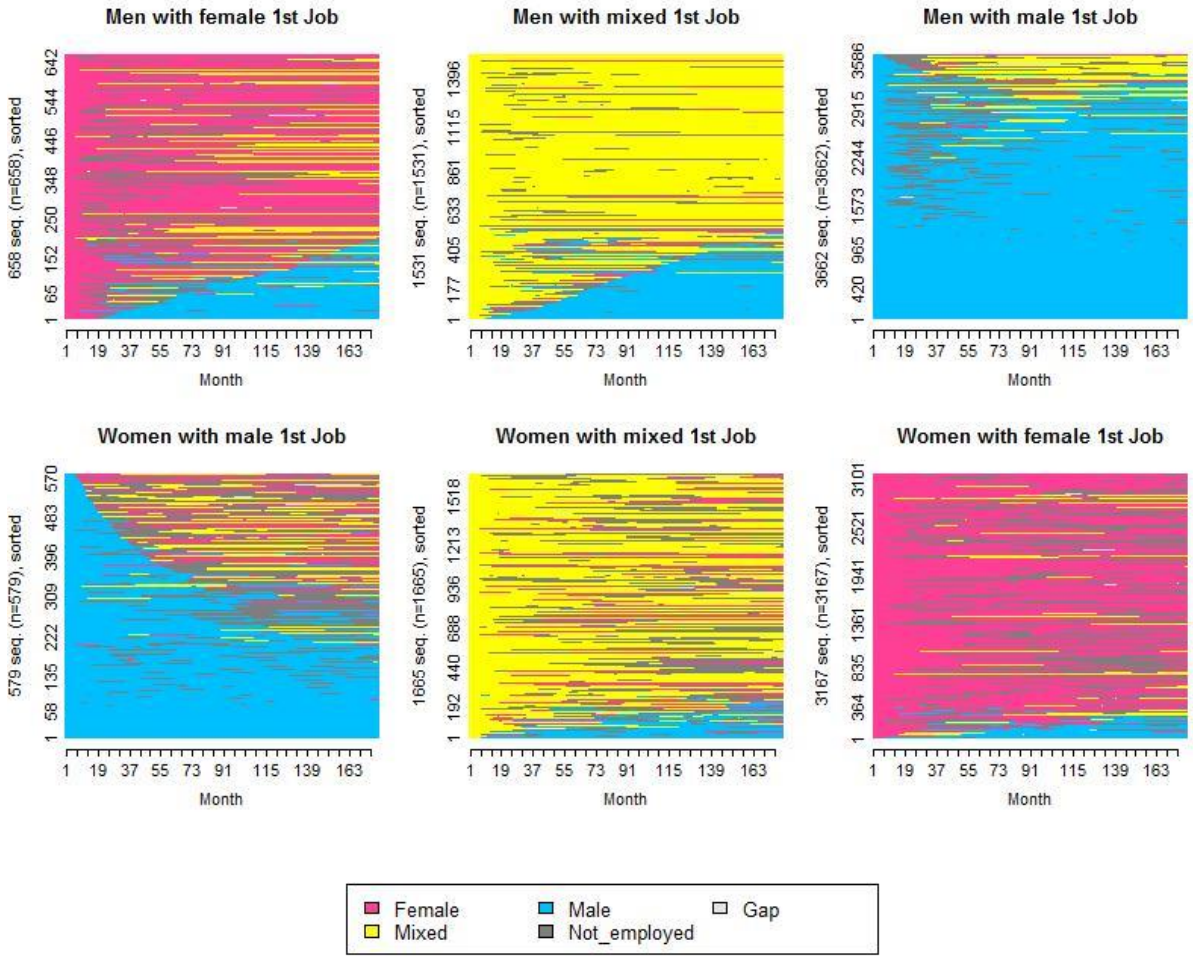
Table 3.1 Gender-type of First Significant Job and Occupational Biography, in Percent

	Women	**Men**
Gender-type of first sign. Job		
female	58,5	11,3
Mixed	30,8	26,2
male	10,7	62,6
Gender-type of employment biography		
female	57,0	10,8
Mixed	30,6	26,2
male	12,4	63,0

Data: NEPS SUF, SC6 D_8-0-0; N=11.262; own calculations.

Looking at the occupational trajectories of men and women it is obvious that gender-atypical occupational choices are more prone to occupational shifts later on (Figure 3.1). From all men entering the LM through a female-typical occupation, only about half continue to work in a female-typical occupation after 15 years. In contrast, nearly 80 percent of men, commencing their working life in a gender-typical occupation, are working in such an occupation at the end of observation time. For women the picture is similar, even though a greater share of women is not working at all at the end of observation time.

Figure 3.1 Occupational Trajectories by Gender and Type of Occupation



Data: NEPS SUF, SC6 D_8-0-0; own calculations.

3.4.2 Cluster Analysis

The cluster analysis of employment sequences result in six typical employment patterns, which are described in the following. Cluster1 consists of pervasive full-time employment biographies (n=7878) only interrupted shortly at the beginning of the employment trajectory (see Figure 3.2). Thus, it represents the typical employment pattern associated with the male breadwinner and is the most frequent observed employment pattern for both men (85.8 percent of all men) and women (55.2 percent of all women). Individuals in cluster 1 are predominantly male and mainly employed in male-typical occupations as expected. Furthermore, they are more likely to stem from older cohorts, which is consistent with the literature on de-standardisation across cohorts. In comparison to members of cluster 2, they are better educated, but have fewer tertiary degrees than members of cluster 3.

Table 3.2 Overview of Cluster Characteristics

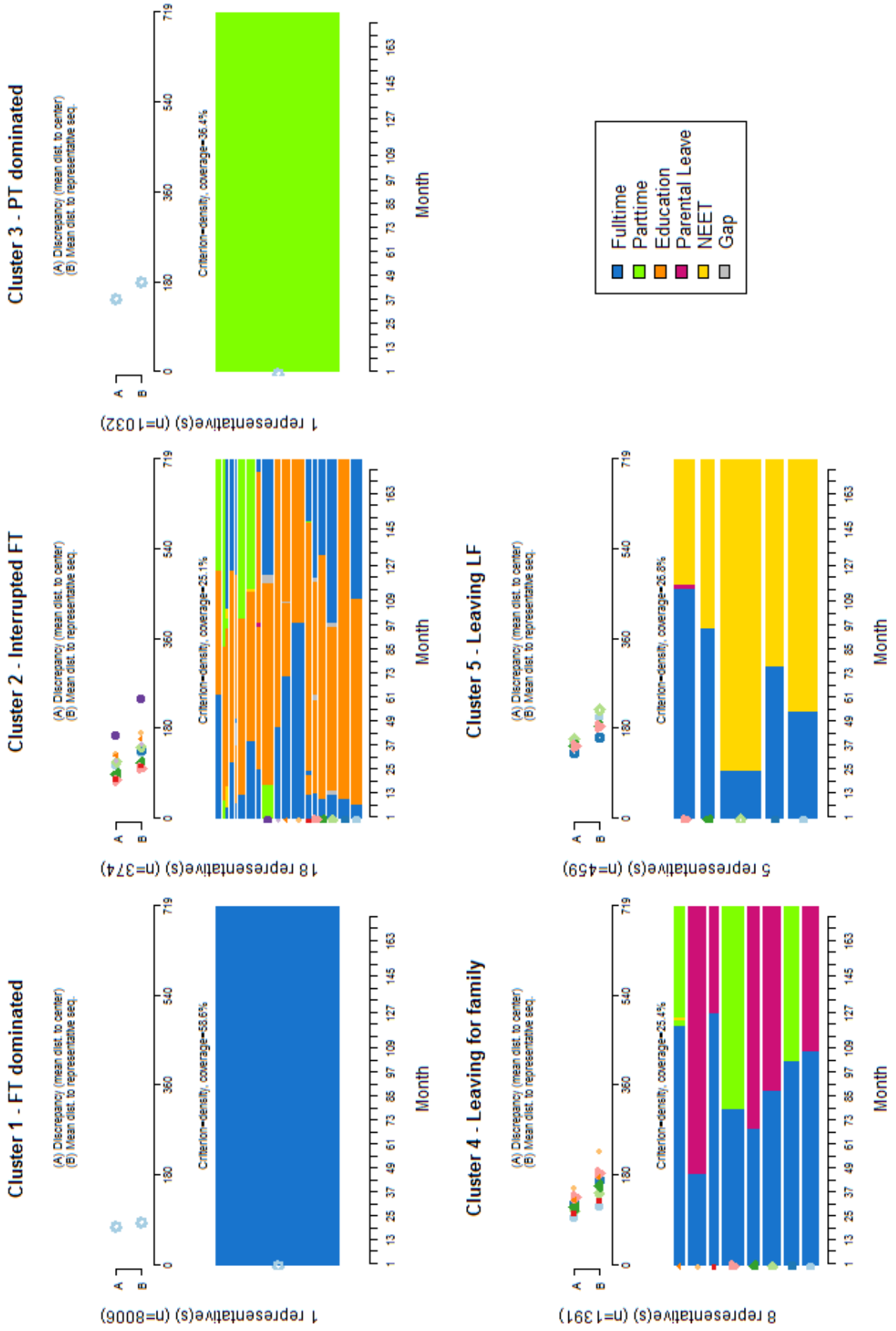
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Number of individual sequences in resp. cluster	8006	374	1032	1391	459
Proportion of Men	62.7 %	59.9 %	34.8 %	5.6 %	37.0 %
Proportion of mainly female occupation	26.2 %	31.0 %	47.2 %	59.8 %	40.3 %
Proportion of mainly mixed occupation	27.6 %	35.8 %	32.3 %	28.5 %	25.1 %
Proportion of mainly male occupation	46.2 %	33.2 %	20.5 %	11.7 %	34.6 %
Socio-demography					
Individuals born between 1944 and 1955	36.8 %	24.9 %	33.6 %	13.2 %	26.4 %
Individuals born between 1956 and 1965	38.3 %	37.7 %	34.7 %	46.2 %	35.5 %
Individuals born between 1966 and 1975	22.2 %	28.9 %	28.5 %	36.3 %	30.9 %
Individuals born between 1976 and 1989	2.7 %	8.6 %	3.2 %	4.4 %	7.2 %
Individuals born abroad	9.4 %	10.2 %	9.4 %	9.1 %	13.7 %
Average age at labour market entry	21.1	20.6	24.0	20.9	20.4
Individuals ever married in obs. time	75.3 %	55.9 %	80.2 %	92.8 %	69.1 %
Average maximum number of children	1.3	1.0	1.5	2.0	1.5
Average duration with children during obs. time	41.7	26.0	56.4	57.9	52.9
Education					
Labour market entry without vocational degree	13.4 %	40.1 %	14.7 %	11.6 %	22.7 %
Labour market entry with vocational degree	71.0 %	52.4 %	42.7 %	75.6 %	69.1 %
Labour market entry with higher educational degree	15.6 %	7.5 %	42.5 %	12.8 %	8.3 %
Individuals with increasing educational degree	9.5 %	65.0 %	7.6 %	4.5 %	7.6 %

Data: NEPS SUF, SC6 D_8-0-0; own calculations.

Cluster 2 is rather small (n=549) and contains career patterns with full-time employment with longer interruptions due to further education and training. 63.2 percent of all employment sequences in this cluster are represented by the sequences visualized in Figure 2 Members of cluster 2 are more or less equal distributed through female male and mixed occupations. They are further characterised by low education at labour market entry which increases due to the investment in further training. Furthermore, they are less likely to be married and have later and fewer children (Table 3.2).

Cluster 3 (n=1778) and 4 (n=620) contain typical employment patterns assigned to women, dominated by part-time work or times off for family reasons (Figure 2.2). Subsequently, their members are predominantly female – in cluster 4 almost exclusively – more often located in female-typical occupations (Table 3.2). Moreover, members of cluster 3 and 4 are characterised by a high share of married individuals with children. Individuals in cluster 3 (part- time dominated) are higher educated already at labour market entry. Subsequently, the average age at labour market entry is highest in this cluster.

Figure 3.1 Representative Sequences by Cluster



Data: NEPS SUF, SC6 D_8-0-0; own calculations.

Last but not least, cluster 5 pools employment patterns that are characterized by leaving the labour force (Figure 3.2). Members of this cluster are mainly female and during their employment time overrepresented in female-typical occupations. They are more often born abroad and comparatively low-educated. However, as these individuals are employed less than half of the observation time, and thus have only short durations of exposure to the disparate settings of occupations with different gender-type.

Based on these descriptive results, the membership in cluster 1 and 3 seem to be the most interesting, because they represent gender-typical employment biographies, but also a significant number of individuals of the opposite sex. Cluster 2 has only few members that do not vary greatly with respect to gender and gender-type of occupation. The obvious dominance of women in cluster 4 (family leave) can be attributed to the family policy during observation time, which disadvantaged men with respect to parental leave opportunities.

3.4.3 Results of Multinomial Logistic Regressions

Table 3.3 presents the results of multinomial logistic regressions of the main gender-type of occupation[12] on cluster membership by gender and gender-type of occupations (for the full models see appendix 3.1). The first three models represent the comparison of men in female-typical (or mixed) occupations with men in male-typical occupations. M1 represents the results for all men, M2 for childless men only and M3 for fathers. In all three models, men (with and without children) in male-typical occupations serve as reference group. Men in mixed or female-typical occupations have a significantly higher likelihood to be member of cluster 2 (interrupted fulltime) or 3 (part-time dominated employment patterns). Especially in female-typical occupations, men in general have a 6.4 percent higher probability to be in the part-time cluster. However, this result is mainly driven by fathers, who have an eight percent higher probability to have a part-time dominated employment pattern in female-typical occupations compared to fathers in male-typical occupations. Even in mixed occupations, men with and without children have a slightly higher likelihood for part-time dominated employment patterns than in male-typical occupations. Furthermore, men (with and without children) have a lower likelihood to have male-typical full-time dominated employment

[12]Because the gender-type of occupation can vary over time, the gender-type of occupation most strongly represented in observation time is used for categorisation. For better readability, I only use gender-type of occupation or men/women in female- / male-typical occupations without “main” or “mainly employed” in the following.

patterns when working in mixed or female-typical occupations. This indicates that male-typical occupations do not support part-time work.

Table 3.3 Explaining the Type of Employment Pattern by Gender and Type of Occupation

Multinomial logistic regressions on cluster membership, average marginal effects

	M1	M2	M3	M4	M5	M6
	All_Men	Childless_Men	Fathers	All_FO	Childless_FO	Parents_FO
	Coef./SE	Coef./SE	Coef./SE	Coef./SE	Coef./SE	Coef./SE
Men						
Cluster 1 – FT dominated				0.433***	0.086*	0.539***
				(0.039)	(0.042)	(0.049)
Cluster 2 – Interrupted FT				0.018**	0.028#	0.014*
				(0.006)	(0.017)	(0.006)
Cluster 3 – PT dominated				-0.023	-0.053*	-0.012
				(0.017)	(0.025)	(0.022)
Cluster 4 – Family leave				-0.452***	-0.080*	-0.559***
				(0.052)	(0.037)	(0.068)
Cluster 5 – Leaving LF				0.024*	0.020#	0.018
				(0.011)	(0.011)	(0.016)
Main gender-type of occupation (Ref. Male)						
*** female**						
Cluster 1 – FT dominated	-0.082***	-0.032	-0.104***			
	(0.016)	(0.029)	(0.020)			
Cluster 2 – Interrupted FT	0.013#	0.026	0.006			
	(0.008)	(0.018)	(0.008)			
Cluster 3 – PT dominated	0.064***	0.022	0.080***			
	(0.012)	(0.018)	(0.015)			
Cluster 4 – Family leave	-0.000	-0.005	0.002			
	(0.005)	(0.006)	(0.007)			
Cluster 5 – Leaving LF	0.006	-0.011	0.015			
	(0.008)	(0.016)	(0.010)			
*** mixed**						
Cluster 1 – FT dominated	-0.030**	-0.015	-0.035**			
	(0.010)	(0.022)	(0.012)			
Cluster 2 – Interrupted FT	0.013*	-0.001	0.017**			
	(0.006)	(0.013)	(0.006)			
Cluster 3 – PT dominated	0.024***	0.025#	0.023**			
	(0.007)	(0.014)	(0.008)			
Cluster 4 – Family leave	0.004	0.011	0.001			
	(0.004)	(0.008)	(0.004)			
Cluster 5 – Leaving LF	-0.011*	-0.020#	-0.007			
	(0.005)	(0.011)	(0.005)			

Note: # p≤0.1; * p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001; Standard Errors in brackets; the model contains following control variables: cohort, age at labour market entry, born abroad, educational degree at labour market entry and change in degree within obs. time, number of children, duration with children in obs. time, and if ever married in obs. time; for the full model see appendix 3.1

Data: NEPS SUF, SC6 D_8-0-0; own calculations.

However, do men in female-typical occupations really assimilate to women in female-occupations? To answer this question, models four, five and six contain the results comparing men and women in female-typical occupations. It is obvious, that even men in female-typical occupations are more likely to have full-time dominated employment patterns (cluster 1) and are less likely to take times of for family reasons (cluster 4). However, with respect to part-time employment there are only gender differences for childless men and women. Thus, fathers in female-typical occupations do not differ in their likelihood to have part-time dominated employment patterns (cluster 3).

The results indicate that men without children in different occupational settings are more similar than fathers. While men without children do not differ between male- and female-typical occupations in any respect, fathers in female-typical occupations differ significantly from fathers in male-typical ones: they are significant less likely to work in full-time and more likely to have part-time dominated employment patterns. Furthermore, it is obvious that only fathers in female occupations assimilate to their female colleagues with regard to part-time work. Men without children are significantly less likely to have part-time dominated employment patterns than women without children, even in female-typical occupations. This finding conflicts previous research, which stated that gender differences are re-enforced by parenthood (e.g. Grunow, Schulz, and Blossfeld 2012). Contrary to previous findings, this study points to smaller gender differences for parents at least in female-typical occupations.

3.5 Summary and Discussion

Despite increasing female educational attainment and higher labour force participation, occupational gender segregation as well as gender differences in employment patterns, turn out to be very persistent phenomena. The majority of previous analyses on causes of gendered employment patterns focus on individual-level or macro-level explanations. This study extends existing research by looking at the influence of occupation-specific opportunities for different forms of employment. Thus, the main focus of this paper is to investigate, if occupational opportunity structures contribute to explain gender differences in employment patterns. For this purpose, I compare men's employment patterns in female-typical occupations to those of their female colleagues and to those of men in male-typical occupations. Consequently, this paper asks: Do employment patterns differ between occupations with different gender composition – independent of gender? Are employment patterns of men in female-typical occupations similar to those of women in female-typical occupations?

Using monthly employment biographies from the NEPS, I apply sequence clustering in order to identify typical employment patterns and with multinomial logistic regressions for several subgroups I estimate in how far gender differences in employment patterns can be explained by occupational gender-type. Furthermore, I compare parents with childless men and women, to examine, if previous result of a re-traditionalisation due to parenthood is observed across all occupations. Drawing from economic theory, which suggests that occupational choice reflect a choice for specific forms of employment, the first hypothesis was that: *Employment patterns of men in female-typical occupations are similar to those of their female colleagues (H1).* The results show that men in female-typical occupations indeed do not differ from their female colleagues, but this is only true for part-time work. However, this result is driven by father's employment trajectories. If one analyses fathers and childless men separately, it becomes apparent that men without children do not differ in their employment patterns – irrespective of the occupational gender-type. A slight increase in part-time employment patterns is visible in mixed occupations. Therefore, looking at the sub-sample of men and women without children, the second competing hypothesis receives support as well. Based on sociological theories, which put the emphasis on cultural gender norms, the second hypothesis was that: E*mployment patterns of men in female-typical occupations do not differ from those of men in male-typical occupations (H2).* This is true for the childless sub-sample.

The differentiation between the two sub-groups was also object of the additional third hypothesis – building on previous research – and expected that: *Gender differences in employment patterns, independent of the gender-type of occupation, are mainly observable among parents (H3).* This hypothesis has to be rejected in this form. Gender differences in female-typical occupations disappear (at least for part-time dominated employment patterns) when comparing parents. Therefore, further research is needed to investigate the underlying mechanisms of this counter-intuitive result. It is possible that men who enter female-typical occupations are generally resistant to cultural gender norms, and that this facilitates both atypical occupational choice as well as atypical career patterns. Alternatively it may be the occupational context, where part-time work is normal that also men are not considered deviating from a social norm when working mainly in part-time when having children. For future research, it would be interesting to examine if fathers with such female-typical employment patterns are more engaged in child care or take on other family responsibilities.

I am aware that this study has several limitations. First of all, analyses of long employment trajectories collected retrospectively are prone to missing or incorrect data. Furthermore, it

cannot be controlled for the context of partnership. It would also be interesting, if men in female occupations take on more family responsibilities because their female partners have higher earnings potentials. This leads to the next point: the data does not provide a proper measure for gender beliefs over time. It would be interesting to analyse if men with strongly egalitarian gender beliefs are more likely to select them-selves into female occupations or if men in female occupations adapt egalitarian gender norms from their surrounding environment at work.

Acknowledgements

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Appendix

Appendix 3.1 Full Models of Multinomial Logistic Regressions on Cluster Membership

	M1	M2	M3	M4	M5	M6
	All_Men	Childless_Men	Fathers	All_FO	Childless_FO	Parents_FO
	Coef./SE	Coef./SE	Coef./SE	Coef./SE	Coef./SE	Coef./SE
Male						
Cluster 1				0.433***	0.086*	0.539***
				(0.039)	(0.042)	(0.049)
Cluster 2				0.018**	0.028#	0.014*
				(0.006)	(0.017)	(0.006)
Cluster 3				-0.023	-0.053*	-0.012
				(0.017)	(0.025)	(0.022)
Cluster 4				-0.452***	-0.080*	-0.559***
				(0.052)	(0.037)	(0.068)
Cluster 5				0.024*	0.020#	0.018
				(0.011)	(0.011)	(0.016)
Main gender-type of occupation (Ref. Male)						
*** female**						
Cluster 1	-0.082***	-0.032	-0.104***			
	(0.016)	(0.029)	(0.020)			
Cluster 2	0.013#	0.026	0.006			
	(0.008)	(0.018)	(0.008)			
Cluster 3	0.064***	0.022	0.080***			
	(0.012)	(0.018)	(0.015)			
Cluster 4	-0.000	-0.005	0.002			
	(0.005)	(0.006)	(0.007)			
Cluster 5	0.006	-0.011	0.015			
	(0.008)	(0.016)	(0.010)			
*** mixed**						
Cluster 1	-0.030**	-0.015	-0.035**			
	(0.010)	(0.022)	(0.012)			
Cluster 2	0.013*	-0.001	0.017**			
	(0.006)	(0.013)	(0.006)			
Cluster 3	0.024***	0.025#	0.023**			
	(0.007)	(0.014)	(0.008)			
Cluster 4	0.004	0.011	0.001			
	(0.004)	(0.008)	(0.004)			
Cluster 5	-0.011*	-0.020#	-0.007			
	(0.005)	(0.011)	(0.005)			
Cohort (Ref. 1944 - 1955)						
*** 1956 - 1965**						
Cluster 1	-0.023*	-0.046*	-0.016	-0.065***	0.022	-0.091***
	(0.010)	(0.021)	(0.011)	(0.018)	(0.031)	(0.022)
Cluster 2	0.006	-0.001	0.009	-0.000	0.001	-0.001
	(0.006)	(0.013)	(0.006)	(0.007)	(0.019)	(0.006)
Cluster 3	0.001	0.022#	-0.005	-0.057***	-0.019	-0.071***
	(0.006)	(0.012)	(0.008)	(0.013)	(0.019)	(0.016)
Cluster 4	0.006*	0.011*	0.005	0.127***	0.007	0.166***
	(0.003)	(0.006)	(0.004)	(0.014)	(0.015)	(0.018)
Cluster 5	0.009*	0.014	0.008	-0.005	-0.011	-0.003
	(0.005)	(0.011)	(0.005)	(0.009)	(0.011)	(0.011)
*** 1966 - 1975**						
Cluster 1	-0.098***	-0.128***	-0.090***	-0.136***	-0.089*	-0.152***
	(0.013)	(0.025)	(0.015)	(0.021)	(0.037)	(0.024)
Cluster 2	0.011#	0.014	0.010	0.001	0.013	-0.003

	(0.006)	(0.015)	(0.007)	(0.007)	(0.021)	(0.007)
Cluster 3	0.048***	0.057***	0.046***	-0.030*	0.067*	-0.056**
	(0.009)	(0.016)	(0.011)	(0.015)	(0.028)	(0.018)
Cluster 4	0.013**	0.016*	0.013*	0.171***	-0.007	0.224***
	(0.004)	(0.007)	(0.006)	(0.017)	(0.016)	(0.021)
Cluster 5	0.026***	0.041**	0.021**	-0.006	0.016	-0.013
	(0.006)	(0.014)	(0.007)	(0.010)	(0.016)	(0.012)
*** 1976 - 1989**						
Cluster 1	-0.114***	-0.177**	-0.094*	-0.169***	-0.102	-0.195***
	(0.032)	(0.059)	(0.038)	(0.044)	(0.079)	(0.051)
Cluster 2	0.011	0.031	0.001	0.052**	0.084#	0.045*
	(0.011)	(0.027)	(0.011)	(0.020)	(0.050)	(0.022)
Cluster 3	0.077**	0.076	0.084*	-0.035	0.001	-0.046
	(0.028)	(0.047)	(0.035)	(0.033)	(0.052)	(0.040)
Cluster 4	0.004	0.037	-0.009***	0.107**	-0.037***	0.147**
	(0.009)	(0.028)	(0.002)	(0.037)	(0.011)	(0.046)
Cluster 5	0.022#	0.033	0.018	0.046#	0.053	0.049
	(0.013)	(0.030)	(0.014)	(0.027)	(0.050)	(0.033)
Born abroad						
Cluster 1	-0.053***	-0.087**	-0.039*	-0.015	-0.071	0.000
	(0.014)	(0.033)	(0.015)	(0.027)	(0.051)	(0.031)
Cluster 2	0.007	0.045*	-0.005	-0.000	0.021	-0.005
	(0.007)	(0.018)	(0.008)	(0.010)	(0.032)	(0.009)
Cluster 3	0.018#	0.007	0.019#	-0.023	-0.001	-0.032
	(0.010)	(0.022)	(0.011)	(0.019)	(0.035)	(0.022)
Cluster 4	0.010*	0.015*	0.009#	0.023	0.015	0.027
	(0.004)	(0.008)	(0.005)	(0.021)	(0.022)	(0.027)
Cluster 5	0.018**	0.020	0.015*	0.015	0.037*	0.010
	(0.006)	(0.018)	(0.006)	(0.011)	(0.016)	(0.014)
Age at beginning of first sign. Job						
Cluster 1	-0.006***	-0.008*	-0.005**	-0.010***	-0.013**	-0.008*
	(0.002)	(0.003)	(0.002)	(0.003)	(0.005)	(0.003)
Cluster 2	-0.000	-0.000	-0.000	0.000	0.001	0.000
	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)
Cluster 3	0.006***	0.007***	0.006***	0.013***	0.007*	0.014***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.003)	(0.002)
Cluster 4	0.000	-0.000	0.000	-0.002	0.003	-0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)
Cluster 5	-0.001	0.001	-0.001	-0.002	0.003#	-0.004*
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Highest educational Degree at LM Entry (Ref. without vocational degree)						
*** with vocational degree**						
Cluster 1	0.054***	0.064*	0.048*	0.005	0.080#	-0.028
	(0.016)	(0.031)	(0.019)	(0.024)	(0.044)	(0.029)
Cluster 2	-0.000	0.005	-0.002	0.012#	0.021	0.011#
	(0.006)	(0.013)	(0.006)	(0.006)	(0.018)	(0.006)
Cluster 3	-0.026*	-0.025	-0.025#	-0.040*	-0.069*	-0.025
	(0.012)	(0.020)	(0.014)	(0.018)	(0.032)	(0.021)
Cluster 4	0.004	-0.002	0.006	0.033	-0.012	0.044#
	(0.005)	(0.008)	(0.005)	(0.020)	(0.024)	(0.026)
Cluster 5	-0.032**	-0.042#	-0.026*	-0.010	-0.021	-0.003
	(0.010)	(0.022)	(0.011)	(0.012)	(0.020)	(0.014)
*** with higher educational degree**						
Cluster 1	0.023	0.047	0.011	-0.131***	-0.197*	-0.143***
	(0.022)	(0.043)	(0.026)	(0.037)	(0.085)	(0.043)
Cluster 2	-0.006	-0.018	-0.001	0.009	-0.003	0.015

	(0.012)	(0.025)	(0.013)	(0.015)	(0.039)	(0.017)
Cluster 3	0.024	0.025	0.024	0.138***	0.234**	0.135***
	(0.016)	(0.027)	(0.019)	(0.031)	(0.080)	(0.034)
Cluster 4	0.005	0.008	0.005	0.007	-0.004	0.007
	(0.007)	(0.015)	(0.007)	(0.030)	(0.034)	(0.038)
Cluster 5	-0.046***	-0.061*	-0.039**	-0.023	-0.031	-0.013
	(0.011)	(0.024)	(0.012)	(0.017)	(0.022)	(0.020)
Advanced Further Training						
Cluster 1	-0.061***	-0.037	-0.068***	-0.010	0.354	-0.029
	(0.016)	(0.035)	(0.018)	(0.030)	(21.780)	(0.037)
Cluster 2	0.088***	0.128***	0.073***	0.071***	0.127	0.059***
	(0.006)	(0.013)	(0.007)	(0.008)	(0.561)	(0.009)
Cluster 3	-0.006	-0.053#	0.009	0.041*	0.050	0.065**
	(0.012)	(0.028)	(0.014)	(0.020)	(3.680)	(0.024)
Cluster 4	-0.007	-0.013	-0.005	-0.070*	-0.515	-0.065#
	(0.007)	(0.013)	(0.008)	(0.029)	(26.596)	(0.036)
Cluster 5	-0.013#	-0.025	-0.007	-0.032#	-0.016	-0.030
	(0.007)	(0.017)	(0.007)	(0.017)	(0.577)	(0.021)
Ever married in observation time						
Cluster 1	0.039***	0.047*	0.031#	-0.066**	0.004	-0.084**
	(0.012)	(0.021)	(0.016)	(0.022)	(0.030)	(0.029)
Cluster 2	-0.023***	-0.036**	-0.018**	-0.025***	-0.057**	-0.017**
	(0.006)	(0.013)	(0.007)	(0.006)	(0.020)	(0.007)
Cluster 3	0.003	0.009	0.001	-0.023	0.022	-0.029
	(0.008)	(0.012)	(0.013)	(0.014)	(0.019)	(0.020)
Cluster 4	0.003	0.003	0.005	0.153***	0.032*	0.174***
	(0.004)	(0.006)	(0.007)	(0.023)	(0.015)	(0.031)
Cluster 5	-0.022***	-0.023#	-0.020***	-0.039***	-0.002	-0.044***
	(0.005)	(0.013)	(0.006)	(0.009)	(0.011)	(0.012)
Maximum Number of Children within Obs.Time						
Cluster 1	-0.004	0.000	-0.010	-0.107***	0.000	-0.124***
	(0.007)	(.)	(0.008)	(0.011)	(.)	(0.013)
Cluster 2	0.006	0.000	0.006	0.000	0.000	-0.001
	(0.004)	(.)	(0.004)	(0.004)	(.)	(0.004)
Cluster 3	0.003	0.000	0.006	-0.008	0.000	-0.001
	(0.005)	(.)	(0.006)	(0.008)	(.)	(0.009)
Cluster 4	0.001	0.000	0.002	0.103***	0.000	0.107***
	(0.002)	(.)	(0.003)	(0.008)	(.)	(0.012)
Cluster 5	-0.005	0.000	-0.003	0.013**	0.000	0.020**
	(0.004)	(.)	(0.003)	(0.005)	(.)	(0.007)
Share of Month with Children						
Cluster 1	0.000#	0.000	0.000	-0.001**	0.000	-0.001***
	(0.000)	(.)	(0.000)	(0.000)	(.)	(0.000)
Cluster 2	-0.000**	0.000	-0.000*	-0.000	0.000	-0.000
	(0.000)	(.)	(0.000)	(0.000)	(.)	(0.000)
Cluster 3	-0.000	0.000	-0.000	0.001***	0.000	0.001***
	(0.000)	(.)	(0.000)	(0.000)	(.)	(0.000)
Cluster 4	-0.000	0.000	-0.000	-0.000	0.000	-0.001#
	(0.000)	(.)	(0.000)	(0.000)	(.)	(0.000)
Cluster 5	0.000	0.000	0.000	0.001***	0.000	0.001***
	(0.000)	(.)	(0.000)	(0.000)	(.)	(0.000)
N	**5851**	**1622**	**4229**	**3717**	**860**	**2857**

Note: # p≤0.1; * p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001; Predictions of average marginal effects for being in cluster 1-5; Standard Errors in brackets;

Data: NEPS SUF, SC6 D_8-0-0; own calculations.

Chapter 4

Glass Ceilings, Glass Escalators and Revolving Doors: Comparing Gendered Occupational Trajectories and the Upward Mobility of Men and Women in West Germany

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Abstract

Drawing from the literature on "glass ceilings" and "glass escalators", we analyze gender differences in career advancement across occupations. We argue that gender-typical occupations provide different opportunities for upward mobility in part due to varying institutional rules and work organizational logics. We further extend previous research by looking at two aspects: accessibility to and likelihood of staying in leadership. Using data from the German National Education Panel Study, we ask: (1) Do men demonstrate an advantage regarding access to and staying in leadership? (2) To what extent does occupational segregation explain gender differences in upward mobility? (3) Do gender effects vary across occupations? Using event history analysis, results confirm that occupational gender segregation largely explains gender differences in upward mobility. We further find that the probability of upward mobility is lower in female and higher in male occupations; however, the male advantage is nevertheless weaker in male occupations.

Keywords: Vertical Sex Segregation; Occupational Mobility; Glass Ceiling; Glass Escalator; Gender Inequality; Discrete-time Event History Analysis; Career Trajectory

4.1 Introduction

Several studies have demonstrated a female disadvantage with regards to upward occupational mobility due to structural barriers commonly referred to as "glass ceilings" (Maume 1999a; Reskin 1993; Cotter et al. 2001). These barriers are often attributed to prejudice based on gender stereotypes of social roles (e.g. Eagly 2003; Eagly and Karau 2002) as well as discrimination and stigmatization, particularly of mothers (Aisenbrey et al. 2009; Benard and Correll 2010; Budig, Misra, and Boeckmann 2012; England 2005; Gangl and Ziefle 2009). In addition to studies of a female disadvantage in male-typical occupations, Williams (1992) demonstrated men to experience more career opportunities for promotion compared to women in female-typical occupations (i.e. "the glass escalator" effect).

We provide a holistic description of how gender effects on upward occupational mobility vary by gender-typical occupations[13]. To this end, much of the empirical research concerning gender differences in career advancement has focused on either the American (e.g. Maume 1999a; Budig 2002) or Scandinavian context (e.g. Hultin 2003). For Germany, there are many studies on gendered occupational careers (for the motherhood penalty in downward occupational mobility see e.g. Aisenbrey, Evertsson, and Grunow 2009, for gender-pay gap see e.g. Brückner 2004, for gender inequalities in occupational prestige see e.g. Härkönen, Manzoni, and Bihagen 2016, or Manzoni, Harkonen, and Karl U. Mayer 2014), on the importance of partner resources for occupational promotion (Bröckel, Busch-Heizmann, and Golsch 2015) or the gender pay gap in managerial positions (Busch and Holst 2009; Holst 2006).

Only one study controls for gender-typical occupational differences. In analyzing the gender gap in attaining a first management position, Ochsenfeld (2012) uses field of study as measurement of gender-typicality of occupation. However, this study only considers access into leadership, but does not consider a potential revolving door mechanism, whereby access to leadership position may not guarantee remaining in this position. Similarly, Dämmrich and Blossfeld (2017) recently investigated a female disadvantage in holding a supervisory position from a country comparative perspective. For Germany they found that women working in male occupations do not significantly differ from men in holding supervisory positions. Although they accounted for horizontal gender segregation, we contribute to the literature by

[13] The gender-typicality of occupations is defined as follows: occupations with more than 70 percent of female employees are defined as female-typical, occupations with 30 up to 70 percent women as mixed, and occupations with less than 30 percent of female employees subject to social insurance contributions as male-typical or henceforth referred to as female, mixed and male.

taking into account two dimensions of a potential male advantage in upward occupational mobility: 1) accessibility and 2) the likelihood to stay in or to leave a leadership position.

Subsequently, we investigate to what extent glass ceiling and glass escalator effects are indeed evident in West Germany. More precisely, we ask: (1) Do men demonstrate an advantage regarding access to and staying in leadership? (2) To what extent does occupational segregation explain gender differences in upward mobility? (3) Do gender effects vary across occupations?

To answer these research questions, the West German case is of special interest. Despite recent changes in work family policies in Germany that are work-family oriented, our observation time is better reflected in the long-standing tradition of the male breadwinner and female caregiver household division of labor that has reinforced gender norms over time (Trappe, Pollmann-Schult, and Schmitt 2015). Moreover, this dynamic has been further strengthened by strong horizontal sex segregation, whereby women typically belong to different occupations than men (Jacob, Kleinert, and Kühhirt 2013).

Previous research has linked this selection process of men and women into gender-typical jobs to explain gender differences in vertical sex segregation (Dämmrich and Blossfeld 2017; Charles 2003). Others have investigated whether men and women are more advantaged in gender-typical or gender-atypical occupations. Some have found evidence of a "glass ceiling" effect for women in male occupations (Reskin and Roos 1990), but a "glass escalator" effect for men in female occupations (Williams 1992; Maume 1999b; Cotter et al. 2001). To this end, we aim to demonstrate to what extent these gender differences are attributed to horizontal sex segregation in West Germany.

Section 2 presents our hypotheses, which are derived from theory and empirical evidence. In Section 3, we discuss our sample using data from the German National Educational Panel Study (NEPS). As this provides monthly employment histories, we use discrete-time hazard models to estimate the influence of gender, gender-typical occupations and the interaction of both on the probability to enter and to stay in leadership positions. The results of the analyses are provided in Section 4. Section 5 discusses results and avenues for further research.

4.2 Theoretical Considerations and Hypotheses

The expected male advantage regarding upward occupational mobility denotes two dimensions: 1) a higher probability to enter leadership positions and 2) a higher probability to stay in leadership positions. This assumption receives support from several theoretical

approaches discussed in more detail in the following sections. As we aim to also disentangle the main and interaction effects between gender and occupational gender composition, we have organized theoretical considerations by 1) gender effects, 2) gender compositional effects and 3) how gender effects vary across female, mixed and male occupations.

4.2.1 Gender and Upward Occupational Mobility

Despite some improvements in female educational attainment and labor market participation in younger cohorts, women often fail to attain leadership positions, which are dominated by men (e.g. Eagly 2003). Several theories have been put forward to explain the well-documented male advantage in upward mobility. For example, the "glass ceiling" effect refers to structural barriers that women face when rising up the career ladder. Consequently, the male advantage is stronger at the top of the status hierarchy than at lower levels (Cotter et al. 2001).

Albeit a highly complex phenomenon, many sociologists have emphasized how gender norms contribute to prejudice against women with regards to obtaining promotions during the career (e.g. Ridgeway 2001; Ridgeway and Correll 2004; Williams 1992). For example, "role congruity theory" argues that women hold fewer leadership positions because these positions are typically associated with characteristics attributed to men (Eagly and Karau 2002). The perceived incongruity between traditional female role characteristics and leadership roles thus stigmatizes women as less appropriate for leadership. Eagly and Karau (2002) further observed that women exhibiting male characteristics are also stigmatized and devalued in comparison to their male counterparts (England et al. 1994; Ridgeway 2001), despite being more congruent with leadership characteristics. Therefore, the male advantage is not only observed when entering leadership, but also over the occupational trajectories of men and women. Based on these theoretical considerations, we hypothesize:

H1a: Men are more likely to enter a leadership position compared to women, irrespective of the gender composition of the respective occupation held.

H1b: Men are less likely to drop out of leadership positions compared to women, irrespective of the gender composition of the respective occupation held.

4.2.2 Gender Composition and Upward Occupational Mobility

In additional to gender effects, there are several studies that attribute male advantages in the labor market to occupational sex segregation (e.g. Charles 2003; Ko, Kotrba, and Roebuck 2015 for the US; Hultin 2003 for Sweden; Busch 2013b for Germany). However, most of these studies do not consider the role of labor market segmentation or provide theoretical arguments for differences in the institutional set-up structuring upward mobility in female and male occupations. Because men and women often (self-)select employment in gender-typical occupations, we argue that much of the gender effect can be explained by the different work arrangements of these occupations. For this reason, we are interested in how gender composition influence leadership opportunities regardless of gender.

As an important aspect of mobility research, labor market sociologists have long debated the relationship between labor market segmentation and opportunities for promotion (Edwards 1979; Sengenberger 1987). The growth of large firms is argued to have contributed to labor market segmentation, as hierarchical career ladders were created as a means to secure employee commitment, control the workplace and to reduce sunk costs caused by worker turnover (Farkas and England 1988; Sørensen and Kalleberg 1981). These characteristics, however, largely describe the career trajectories in male occupations.

In contrast, female occupations tend to be primarily aligned either with low-skilled, service sector or semi- and high-skilled, professional occupations. The first type of female occupations exhibits the "revolving doors analogy" comprising low-wage, dead-end jobs that do not provide opportunities for career advancement (Jacobs 1989; Charles and Grusky 2004; Williams 2013). The second type of female occupations is more closely associated with occupational-specific professions (e.g. teaching professions or health professions).

As upward mobility opportunities are highly differentiated across occupations, we expect that female occupations offer fewer opportunities for promotion than male occupations irrespective of the employees' gender. Subsequently, much of the so-called gender effect may actually reflect the selection of women into female occupations that do not offer many opportunities for promotion. Therefore, we hypothesize:

H2a: Men and women are more likely to hold a leadership position in male-typical occupations and less likely in female-typical ones compared to mixed occupations.

H2b: Men and women are less likely to drop out of leadership positions in male-typical occupations and more likely in female-typical ones compared to mixed occupations, irrespective of gender.

4.2.3 Gender Composition and Upward Occupational Mobility by Gender

In addition to the direct effects of gender and occupational sex segregation, other researchers have argued that the effect of occupational sex segregation may also vary by gender (Dämmrich and Blossfeld 2017; Maume 1999b; Reskin and Roos 1990; Reskin 1993; Cotter et al. 2001). To this end, we lastly inquire whether the male advantage is stronger in male or female occupations. In the following paragraphs, we review several theories that offer polarized viewpoints that we have adopted here as competing hypotheses.

The implicit effect that gender has on the job-matching processes has been extensively demonstrated in relation to statistical discrimination and others means of social closure, i.e. the process by which a group attempts to maintain their position by preventing others from entering (Reskin 1988; Acker 1990; Baron and Newman 1990; Cockburn 1991; Maume 1999a). Women entering male occupations, they not only enter a job queue as job search and job matching theories suggest, but they also enter a "gender queue" whereby employers rank women beneath men due to gender stereotypical belief (Jacobs 1989; Reskin and Roos 1990). For this reason, women are often more disadvantaged when competing for jobs and promotions so that they often are eventually driven out of male occupations due to discrimination or the lack of opportunities (Reskin and Roos 1990).

Kanter's theory of "tokenism" similarly argues that all tokens or minorities are disadvantaged due to heightened visibility, prejudice and gender segregating processes that contribute to social exclusion (Kanter 1977). In line with this theory, men and women are more likely to hold a leadership position in gender-typical occupations than in atypical ones. Respectively, a third hypothesis tested here is:

H3a: The likelihood to enter a leadership position is higher through gender-typical occupations than gender-atypical ones.

In line with the revolving doors analogy (Jacobs 1989), individuals in gender-typical occupations are less likely to drop out of these occupations. Thus, we further hypothesize that men and women spend more time in leadership in gender-typical occupations:

H3b: The likelihood to drop out of leadership positions is lower in gender-typical occupations rather than in gender-atypical ones.

In contrast to Kanter's theory of tokenism, however, role congruity theory argues that men have a greater advantage in upward occupational mobility in female occupations because they are "only" competing with women whose gender roles are less closely aligned to leadership role characteristics. Similarly, Williams (1992) also argues that men demonstrate a greater advantage in female occupations due to gender stereotyping prejudice in favour of men for leadership positions. Empirical support for this argumentation is given by Dämmrich and Blossfeld (2017). In a country comparative study, they investigate women's disadvantage in holding supervisory positions based on the ISCO classification of occupations. Coined as the "glass escalator" effect, this perspective presents competing hypotheses to H3a and H3b:

H4a: The male advantage in entering a leadership position is highest in female occupations rather than male ones.

H4b: The male advantage regarding a lower drop out of leadership position is highest in female occupations rather than male ones.

4.3 Data and Methods

4.3.1 Data and Sample

To compare gender and gender compositional effects on upward occupational mobility, we use information on monthly employment biographies from the NEPS, starting cohort 6, (see Blossfeld, Roßbach, and von Maurice 2011). This longitudinal dataset contains retrospectively collected employment biographies of individuals born between 1944 and 1986. We use the first four waves available as scientific use file (SUF), carried out from 2009 to 2013. Furthermore, a previous wave of the adult survey was conducted from 2007 to 2008 by the Institute for Employment Research (IAB) under the title, Working and Learning in a Changing World" (ALWA).

We follow individuals from their first significant job for a period of 15 years (180 months). Hence, recent changes in work-family policies are not covered by our data. The first significant job is defined as the first job between the age of 15 and 35 that lasted at least 6 months, which has been similarly used in several previous studies (e.g. Lindemann and Kogan 2013; Smyth 2005). Jobs in preparation for a career, such as internship, traineeship, preparatory service and jobs as student worker are not included. We also excluded

respondents who never had a first significant job or have missing information for additional sample-defining characteristics, such as gender or birth date. Furthermore, we excluded individuals born after 1975, as there are too few individuals in the latter birth cohort that adhere to our selection criterion of 180 months of observation following their first significant job. After data preparation and cleaning, our sample consists of 6,402 individual employment biographies of which 2,926 are female (45.7 percent) and 3,476 are male (54.3 percent). We cover the birth cohorts from 1944 to 1955 (32.8 percent), from 1956 to 1965 (41.1 percent) and from 1966 to 1975 (26.1 percent). For further descriptive statistics see appendix 4.1 and 4.2.

4.3.2 Variables

Our primary variables of interest are: 1) upward occupational mobility, 2) the gender of respondent and 3) gender composition of the occupation held at each point in time. In the following we show how these concepts are operationalized.

4.3.2.1 Upward Occupational Mobility

With regards to upward occupational mobility, we are chiefly interested in whether men are more likely, to enter and to stay in leadership compared to women. A leadership position is defined as supervisors and executives, coded with "9" as digit four of the KldB2010 – the German job classification – coding, and coded with 3 or 4 as digit five of KldB2010 (educational requirement level). Following the German statistical office, we also code 71104 (Managing directors and executive board members-highly complex tasks), 71214 (Legislators-highly complex tasks) und 71224 (Senior officials of special interest organizations-highly complex tasks) as leadership positions (Eisenmenger et al. 2014). Regarding this definition 253 of the 1286 occupations are defined as leadership position. However, not all occupations are represented in our sample.

The first outcome "entering leadership position" is defined as first month of an employment in a leadership position after entering the labor market; the second outcome "staying in" versus "leaving" is defined as any state which is not a leadership position after holding one. This is irrespective to job change, i.e. if the individual continues in another leadership position at a different job, the time spent is viewed as leadership continuous. Furthermore, we are not able to control for if the drop out is voluntary or involuntary.

4.3.2.2 Gender and Gender-Type of Occupation

While the interviewers report the respondents' gender, the occupation is surveyed by the open question: "Let's start with the first job you had since <DATE>. Please tell me what occupation this was!" The additionally merged gender composition of occupations based on the German Mikrozensus is provided by the German Labor Agency. As the gender composition of occupations is subject to changes over time, we use the mean share of female employees between the years 2001 and 2011[14]. The occupations were then categorized as female occupations with more than 70 percent of female employees, mixed occupations with 30 up to 70 percent women, and male occupations with less than 30 percent of female employees subject to social insurance contributions[15].

4.3.3 Methods

For a first glance we use sequence visualization to describe occupational biographies of men and women. Therefore, we distinguished between nine mutually exclusive states that are based on employment activity, the gender composition of a job held and whether or not the position is in a managerial capacity. These include: (1) manager in female occupation, (2) employee in female occupation (3) manager in mixed occupation, (4) employee in mixed occupation (5) manager in male occupation, (6) employee in male occupation, (7) parental leave, (8) unemployment and (9) education and training. Additionally, we had to include a tenth state for gaps.

In a second step we look at Kaplan-Meier survival functions. To compare the survivor functions between our groups of interest, we are calculating risk sets for each of the 180 month of observation "for being in a leadership" position or "not being in a leadership" position. Firstly, we compare leadership positions held by men and women; secondly, we compare the duration of men and women in leadership position by gender-type of occupation. For both calculations, we use four test statistics: Log-rank, Wilcoxon, Tarone-Ware and Peto-Peto test as recommended by Blossfeld, Golsch, and Rohwer (2007).

In a third step, we use discrete-time event history models, which documents whether, and if so, when events occur (Andreß, Golsch, and Schmidt 2013). We use separate analyses for our

[14] The mean is based on the data from 30th of June as record date for each year to prevent bias of seasonal variation. At that time, the labor market is sturdiest due to stable weather conditions.

[15] With a stricter cutting point of, for example, 80 percent, there are too few occupations female-typical and with a lower cutting point, such as 60 percent, occupations that have a nearly balanced gender ratio are also defined as female. However, lower and higher cutting points are used for robustness checks.

two outcome variables of interest: 1) we model the accessibility of leadership for the whole sample and 2) we estimate the probability to leave the leadership position for those who at least once in observation time hold a managerial position. Subsequently, our dependent variables are conditional transition probabilities that individual i will experience the respective event at time t, given that the individual hadn't such a transition already in the past. We do not allow for repeating events. Thus, we only consider the first managerial position observed and assume that the dependent variables are dichotomous: "0" for the origin state and "1" for the destination state. Observations after the first occurrence of the event of interest are no longer part of the analysis.

As the starting point of our observation period, we identify the first significant job as the point of entry. For the second analysis, we begin with entry into the first leadership position. Although our data are not left censored, we do not know or do not take into account if any of the observed individuals move up into or leave a leadership position after observation time. Thus, we may have right censored data. For this reason, we chose this period length of 15 years apart from labor market entry to have a balanced panel data set.

The event history model is estimated using logistic regression, including a time variable as independent covariate, and time-constant as well as time-varying control variables (for more detailed discussion see e.g. Andreß, Golsch, and Schmidt 2013). Furthermore, we use robust standard errors to consider that months are nested within individuals.

4.4 Results

To first examine the relationship between the probability to enter a leadership position with gender and gender-typical occupations, Section 4.1 presents the visualization of occupational biography sequences; in section 4.2 we report results for Kaplan-Meier Survivor Functions by gender and gender-type of occupation, as well as regression results of event history analysis for entering a leadership position; and finally section 4.3 shows the results for the probability to drop out of leadership for the subsample of those who hold such a position.

4.4.1 Leadership Position by Gender and Gender-Typical Occupation

Table 1 shows the share of men and women in leadership positions for each of the gender-typical occupations. Based on the KldB2010 measure, only 6.2 percent of individuals in the sample hold a leadership position. With regards to gender differences, men appear to have a

comparative advantage over women: Only 3.4 percent of women hold a leadership position, compared to 9 percent of men.

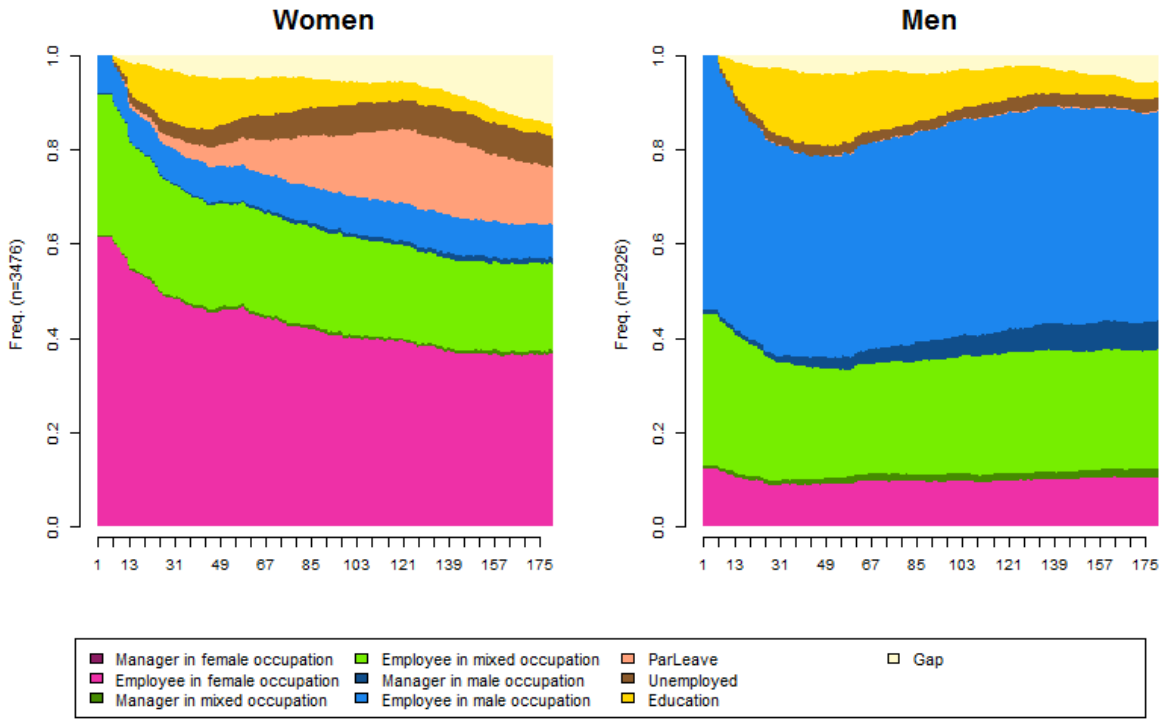
Table 4.1 Duration in Leadership by Gender and Type of Occupation

	Women	Men	Total	Chi² (Pr)
Female-typical Leadership Occupation (n=7,686)	58.1	49.2	56.6	0.000
Mixed Leadership Occupation (n= 26,288)	62.3	89.2	78.4	0.000
Male-typical Leadership Occupation (n=54,708)	62.6	87.7	81.6	0.000
All Occupations (n=88,695)	61.5	87.3	78.5	0.000

Data: NEPS SUF, SC6 D-5.1.0; own calculations.

Similarly, to the access analysis, all gender differences are highly significant and as expected. Women seem to have an advantage in female occupations, while men demonstrate a comparable advantage in mixed and male occupations. Compared to women, men are only more likely to stay in a leadership position in mixed or male- occupations compared to female ones. From these descriptive results, men are more likely to stay in leadership positions in gender-typical occupations. A male advantage in female occupations is not observable.

Figure 4.1 Sequence Distribution Plot of Occupational States, by Gender



Note: Time (x-axis) is the number of months following the first significant job.

Data: NEPS SUF, SC6 D-5.1.0; own calculations.

In Figure 4.1, we illustrate the distribution of occupational states by gender for a period of 180 months, following the first significant job. Both men and women are likely to start their

employment biography in a gender-typical occupation (62% for women and 56% for men). Thereby, at least at labor market entry, men are less gender-typical than women. In addition, the difference between distributions of occupational states at 1 and 180 months is much more varied for women than it is for men. For example, the share of women working in a female occupation has decreased from 60 to less than 40 percent by the end of observation period.

For men, the share employed in a male occupation is nearly the same in month 180 after labor market entry. It should also be noted, however, that roughly 35 percent of women have dropped out of the labor market by month 180, presumably accounting for much of the decline of women in female occupations. It is also observable that the gender differences in holding a leadership position, is smallest at the beginning of observation time. As time goes by, more men than women enter leadership positions, especially in male occupations. Regardless of the occupation, however, the highest proportion of leadership positions is observable at the end of observation time, for both men and women.

4.4.2 Access to Leadership Positions

4.4.2.1 Kaplan-Meier Survivor Function

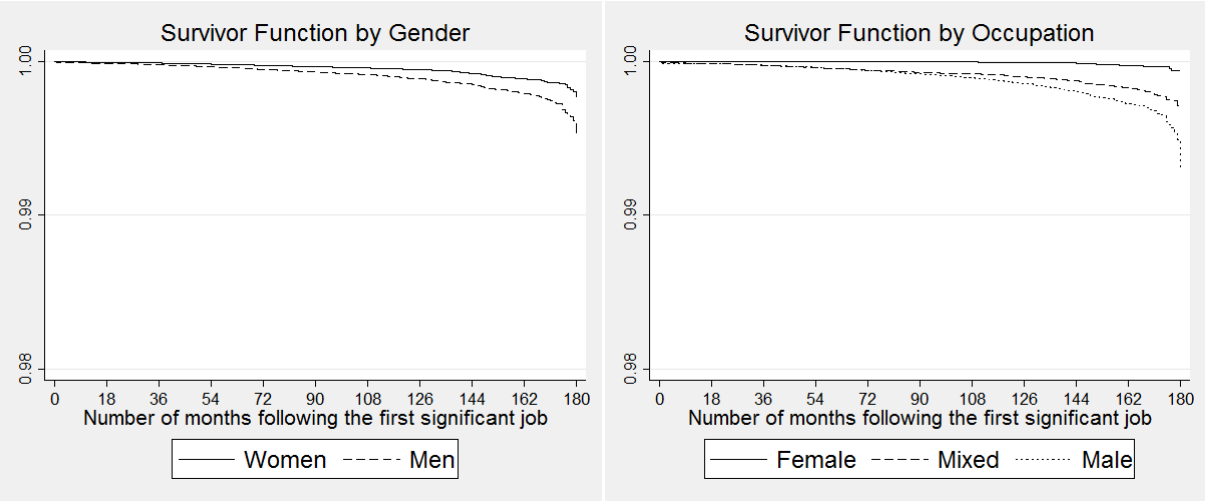
In this section, we present results from product-limit estimations by gender and gender-type of occupation. This technique has the advantage to be a time-driven estimation technique, meaning that we can demonstrate how differences develop over observation time. The survival curves demonstrated in Figure 4.2 reflect the effect of gender – or respective gender-type of occupation – on the probability to "survive" without entering a leadership position. Thus, a "failure" means upward occupational mobility. Subsequently, we applied several test statistics to test whether differences between the groups are significant.

It is obvious that differences are increasing over time, even if they remain relatively small. However, we can observe the expected pattern: men seem to have an advantage to "not survive" without upward mobility. All four applied test statistics confirm that gender differences are highly significant (Pr>chi2 = 0.000).

Similarly, the survivor functions by gender-type of occupation meet our expectations: Individuals in female occupations are at lower risk to take up a leadership position then individuals in mixed and especially male occupations. All four test statistics again are highly significant (Pr>chi2 = 0.000). However, none of those survivor functions consider a possible

interaction of gender and gender-composition. Furthermore, it is not controlled for further heterogeneity between the groups. Therefore, we show results of event history models in the following.

Figure 4.2 Access to Leadership, by Gender and Type of Occupation



Data: NEPS SUF, SC6 D-5.1.0; own calculations

4.4.2.2 Regression Results

To disentangle the relevance of gender, gender-type of occupation and their interaction for the upward occupational mobility of men and women, we estimate hierarchical discrete-time event history models with robust standard errors (Table 4.2). In the first model we only include gender as explanatory variable beside all control variables; in model 2 we add the gender-type of occupation and model 3 contain both plus their interaction. In this way, Likelihood-Ratio tests can be used additionally to the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) to assess the model fit.

The overall model fit measure AIC indicates that model 3 including also the interaction effects is the best model. The BIC measure is slightly lower for M2, but the AIC measurement is more straightforward than the BIC, therefore, the recommended choice if there are contradictory outcomes. Furthermore, model 3 is also recommended looking at the LR-Test results: M1-M2 (Prob > chi2 = 0.000) and M2-M3 (Prob > chi2 = 0.000).

In line with the results of the Kaplan-Meier survivor curves, the time variable shows a general increase of the conditional transition probability that individual i will experience upward occupational mobility at time t, given that the individual hadn't such a transition already in the past. Also, the main effects of gender and gender-type of occupation are significant and

confirm the results from Kaplan-Meier estimation. When controlling for gender-typicality of occupation (M2), the male gender has a non-significant, negative effect on the conditional transition probability. However, this can be explained through the missing interaction effect, as the gender effect returns to be significantly positive after the interaction is included. Thus, it can be concluded that the consideration of only one aspect – or both main effects –does not lead to proper estimations.

Table 4.2 Logistic Event History Analysis for Access to Leadership Positions

	M1	**M2**	**M3**
State number per ID	0.021***	0.020***	0.020***
Men	0.792***	-0.096	0.294#
Gender-Type of Occupation (Ref. Mixed)			
# sextype female		-2.213***	-2.329***
# sextype male		0.728***	1.230***
Interaction of Gender and Gender-Type of Occupation (Ref. Mixed)			
# men*female occupation			0.793#
# men*male occupation			-0.768***
Time Constant Control Variables			
Cohort (Ref. 1944 - 1955)			
# 1956 - 1965	-0.022	-0.122	-0.113
# 1966 - 1975	0.085	-0.012	-0.008
Born in Germany	-0.115	0.029	0.026
Age at LM Entry	0.033*	0.040**	0.038**
Educational Degree at LM Entry (Ref. without vocational degree)			
# with VET	0.238#	0.229	0.265#
# with higher educational degree	0.484*	0.381	0.394
Time Varying Control Variables			
Marital Status (Ref. Single)			
# married	-0.226#	-0.222#	-0.218#
# divorced	0.038	-0.003	0.007
Number of Children	-0.165	-0.109	-0.125
Number of months employed	-0.028***	-0.028***	-0.028***
Number of months in parental leave	-0.007	-0.003	-0.003
Number of months in unemployment	-0.014*	-0.012#	-0.012
Number of months in further education	-0.006	-0.004	-0.005
Employed as public official	-1.281***	-0.849*	-0.937**
Self-employed	0.118	-0.372	-0.487
Constant	-8.465***	-8.135***	-8.304***
N	836474	836474	836474
Pseudo R-squared	0.03	0.07	0.07
AIC	9253.72	8945.95	8927.97
BIC	9474.82	9190.33	9195.62

Note: *** p<0.001, ** p<0.001, * p<0.05, # p<0.1; Robust standard errors in parentheses.
Data: NEPS SUF, SC6 D-5.1.0; own calculations.

Our results show that women have a significant disadvantage to enter leadership positions compared to men in all occupations. Thus, we find support for H1a: Men are more likely to enter leadership positions compared to women, irrespective of the gender composition of the

respective occupation held. Furthermore, we can support H2a: Men and women are more likely to enter a leadership position in male occupations than in mixed ones and less likely to enter a leadership position in female occupations.

Additionally, we find supporting evidence for H3a from the interaction effect of gender and gender-type of occupation. The effect for men is the sum of the main coefficient of "sextype male" (1.230) plus the interaction for men in male occupations (-0.768), which results in a significant positive effect (0.462). Thus, men are more likely to enter a leadership position through male and mixed rather than female occupations, even if the advantage in male occupations is smaller for men than for women. For women, H3a has to be rejected because they have the highest likelihood to enter leadership in male occupations. This finding is in line with previous research in Germany that found women to be less disadvantaged in male occupations (Dämmrich and Blossfeld 2017). The absence of a strong male advantage in male occupations may in part be explained by unobserved personality traits of women who take up male occupations (e.g. lower risk aversion, career-orientation, etc.). However, the disadvantage to enter leadership in female occupations is less pronounced for men, while the advantage in male occupations is smaller for men than for women. Thus, we as well do find support for a male advantage – in form of a smaller disadvantage – compared to women in gender-atypical occupations, which supports H4a.

4.4.3 Leaving Leadership Positions

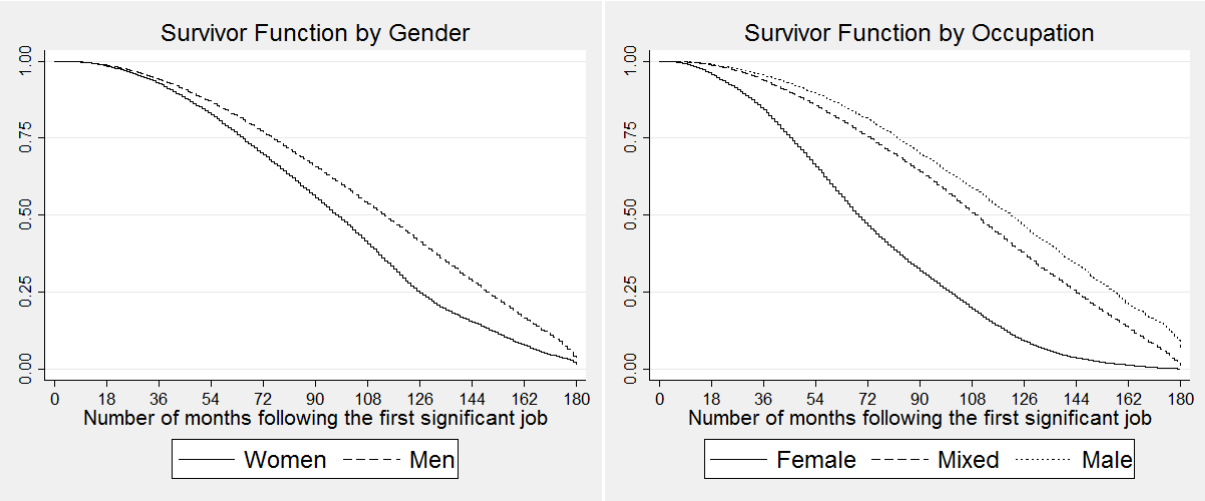
In the following, we restrict our observations to those individuals who already entered a leadership position. We are now interested in a possible male advantage of staying in a leadership position. Like in the previous section, we first report results from survivor analyses and second from event history regression.

4.4.3.1 Kaplan-Meier Survivor Function

The survival curves in Figure 3 reflect the effect of gender and gender-type of occupation on the probability to "survive" within a leadership position. Subsequently, a "failure" means the dropout of leadership and stands for the revolving doors. With regards to the "survival" in a leadership position, a comparable male advantage is not observable. Following, the applied test statistics do not confirm gender differences, except the Wilcoxon: Log-rank (Pr>chi2 = 0.697), Wilcoxon (Pr>chi2 = 0.008), Tarone-Ware (Pr>chi2 = 0.124), Peto-Peto (Pr>chi2 = 0.312). However, a gender-typicality effect is indeed evident and in line with our

expectations. The probability to "survive" within a leadership position is steeply decreasing over the observation period, lowest in female occupations and highest in male ones. All four test statistics are highly significant (Pr>chi2 = 0.000).

Figure 4.3 Dropping Out of Leadership, by Gender and Type of Occupation



Data: NEPS SUF, SC6 D-5.1.0; own calculations.

While the descriptive results above indicate a stronger gender effect with nearly no differences between mixed and male-typical leadership positions, the Kaplan-Meier estimations are inconsistent. Therefore, it is important to have a closer look at the multivariate analysis for a final assessment of results.

4.4.3.2 Regression Results

The event of interest for the following event history analysis is "dropping out of leadership" and refers to the revolving door analogy. The month of entry in the first leadership position is the new starting point of analysis. As in the first analysis, a "failure" or drop out of leadership aligns with sample attrition as an individual that already left leadership is no longer "at risk" of dropping out of leadership.

As in the previous section, results are presented including the model fit measures. Most obvious, the model seems to be more appropriate to estimate the conditional probability of "surviving" within a leadership position. Nearly all coefficients are highly significant. The same is true for the LR-Tests which suggest that the full model including the interaction effects is the most appropriate one (M1-M2: Prob > chi2 = 0.000 and M2-M3: Prob > chi2 = 0.000). AIC and BIC confirm this suggestion.

The time effect is increasing again in this model, as it was already visible in the Kaplan-Meier curves. In comparison to the results for leadership access, there is no general male advantage for not leaving leadership position. Deviating, the gender-effect indicates a higher transition probability out of leadership for men, but only in M2, without control for the interaction. Thus, we are unable to confirm H1b that men have a general advantage for remaining in a leadership position.

Table 4.3 Logistic Event History Analysis for Dropping Out of a Leadership Positions

	M1	M2	M3
State number per ID	0.022***	0.023***	0.023***
Men	0.115	0.529#	0.531
Gender-Type of Occupation (Ref. Mixed)			
# sextype female		2.381***	2.952***
# sextype male		-0.573*	-0.849#
Interaction of Gender and Gender-Type of Occupation (Ref. Mixed)			
# men*female occupation			-1.258#
# men*male occupation			0.330
Time Constant Control Variables			
Cohort (Ref. 1944 - 1955)			
# 1956 - 1965	0.014	0.007	0.001
# 1966 - 1975	0.168	0.181	0.170
Born in Germany	0.031	0.040	0.008
Age at LM Entry	-0.087*	-0.063	-0.067#
Educational Degree at LM Entry (Ref. without vocational degree)			
# with VET	-0.084	-0.044	-0.043
# with higher educational degree	0.320	0.323	0.363
Time Varying Control Variables			
Marital Status (Ref. Single)			
# married	-0.192	-0.344	-0.339
# divorced	0.800**	0.733*	0.757*
Number of Children	0.611**	0.546**	0.571**
Number of months employed	-0.006*	-0.007*	-0.007**
Number of months in parental leave	-0.003	-0.009	-0.011
Number of months in unemployment	0.051*	0.042#	0.042#
Number of months in further education	-0.000	0.002	0.001
Employed as public official	0.095	-0.262	-0.185
Self-employed	0.896	0.643	0.489
Constant	-0.091	-0.832	-0.702
N	50892	50892	50892
Pseudo R-squared	0.13	0.21	0.21
AIC	53654.54	48808.49	48546.69
BIC	53813.61	48985.24	48741.12

Note: *** p<0.01, ** p<0.05, * p<0.1; Robust standard errors in parentheses.
Data: NEPS SUF, SC6 D-5.1.0; own calculations.

However, the effect of gender composition is in line with our expectations in H2b. Women and men do have a higher probability to drop out of leadership in female compared to mixed occupations. The lower probability to drop out of leadership in male occupations compared to mixed ones is only significant for women so that men do not have an advantage in gender-

typical occupations. Thus, H3b has to be rejected. However, the disadvantage of a higher drop out risk in female occupations is lower for men. Thus, we find empirical support for H4b, as a male advantage is again visible in form of a lower disadvantage in female occupations.

4.5 Discussion

We have argued that both gender and occupational gender composition have an independent effect on the likelihood to enter and to stay in leadership. To draw support for this claim, we have presented several theoretical perspectives that offer potential explanation for these effects, including gender role congruity theory, labor market segmentation theory, devaluation theory, tokenism theory and social closure theory. Using these arguments, we contribute to the literature by specifically theorizing as to why gender-typical occupations present different opportunity structures for entering leadership positions and how these may vary by gender.

Using sequence visualization, Kaplan-Meier survivor analysis and event history regression, we examined conditional transition probabilities of men and women into and out of leadership positions. Thereby the aim of this paper was to disentangle effects of gender, gender composition of occupations and their interaction.

For access to leadership positions, most of our hypotheses are supported. Men do have a comparable advantage in entering leadership positions. There likelihood to enter leadership is highest in male occupations. However, their comparable advantage over women is highest in female occupations but in form of a smaller disadvantage. Our analyses support the presence of a male advantage with regards to upward occupational mobility, even when controlling for occupational gender composition (H1a). Additionally, we were able to show the importance of the gender-typicality of occupations. We presented discrete-time event history results for each of the outcome variables. In line with our theoretical expectations, we find that compared to mixed occupations, female-typical occupations have a negative effect on access to leadership, while male-typical occupations have a positive effect (H2a).

A particular surprising result, however, is the interaction effect between the two. In the theoretical section, we presented two competing hypotheses. We hypothesized that leadership access would be higher in gender-typical occupations rather than atypical ones (H3a). We further tested for a glass escalator effect, whereby the male advantage was hypothesized to be stronger in female occupations rather than male ones. We found that the likelihood for leadership access is highest in gender-typical occupations, but this is only the case for men. Moreover, we found support for H4a, although the male-advantage is only evident in form of

a smaller disadvantage compared to women. Thus, we do not find any evidence of a glass escalator for men, but an advantage compared to women in female occupations.

Table 4.4 Overview of Hypotheses and Findings

	Access to Leadership (a)	Finding	Staying in Leadership (b)	Finding
H1	Men are more likely to enter a leadership position compared to women, irrespective of the gender composition of the respective occupation held.	Yes	Men are more likely to stay in a leadership position compared to women, irrespective of the gender composition of the respective occupation held.	No
H2	Men and women are more likely to hold a leadership position in male-typical occupations than in female-typical ones.	Yes	Men and women in male-typical occupations are more likely to stay in leadership positions, irrespective of gender.	Yes
H3	The male advantage in entering a leadership position through gender-typical occupations is greater than gender-atypical ones.	Yes	The male advantage in staying in a leadership position is higher in gender-typical occupations rather than in gender-atypical occupations.	Yes
H4	The male advantage in entering a leadership position is highest in gender-atypical occupations rather than gender-typical ones.	Yes in form of smaller disadvantage	The male advantage in staying in a leadership position is highest in gender-atypical occupations rather than gender-typical ones.	Yes in form of smaller disadvantage

The second dimension of the comparable male advantage in upward occupational mobility refers to the revolving doors analogy, meaning wherein that individuals – especially women – who manage to enter a leadership position are forced out again. The findings from this analysis are perhaps the most surprising as the male advantage is not statistically significant (H1b). However, the expected gender composition effect is indeed evident: Men as well as women have the highest dropout risk in female occupations (H2b) even if this disadvantage in female occupations is again less pronounced for men, so that H3b as well as H4b receives support from our results and are not thus competing as expected. There is no male advantage compared to women to stay in leadership position in male occupations.

The general conclusion from our results is that it is not appropriate to analyze gender differences in upward occupational mobility without taking into account the gender composition of occupations and especially the interaction effects. Furthermore, investigating only the access to leadership provides only limited insight into the male-advantage regarding leadership. While many studies have focused on gender differences in leadership access, we found only significant gender differences in terms of staying in leadership for female occupations.

Nevertheless, our results suggest that the (self-)selection into gender-typical occupations largely fosters a male advantage regarding access and lead to a gender difference in dropout risks out of leadership. The lower dropout risk for women in mixed and especially male occupations is likely to reflect a specific selection of women into leadership and into male occupations regarding other factors, such as personality or career-orientation. Unfortunately, we were not able to control for or analyze a probable mechanism of (self-)selection with our data. Therefore, further research is needed to assess results properly. The use of experiments is particularly promising to provide important insights into these mechanisms underlying gender differences and gender discrimination (see also Correll, Thébaud, and Benard 2007).

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Appendix

Appendix 4.1 Descriptive Statistics for Leadership Access

	Obs	Mean	Std. Dev.	Min	Max
Explanatory Variables					
Month of Observation	836474	87.00528	52.70041	1	180
Gender (male=1)	836474	0.4841752	0.4997498	0	1
Gender-type of Occupation: female	836474	0.3678381	0.4822173	0	1
Gender-type of Occupation: mixed	836474	0.3051201	0.4604585	0	1
Gender-type of Occupation: male	836474	0.3270418	0.469133	0	1
Time-Constant Controls					
Cohort: 1944 - 1955	836474	0.3400357	0.4737211	0	1
Cohort: 1956 - 1965	836474	0.4145676	0.4926475	0	1
Cohort: 1966 - 1975	836474	0.2453967	0.4303224	0	1
Born in Germany	836474	0.9011374	0.2984776	0	1
Age at LM Entry	836474	21.58556	3.717296	15	35
Highest Education Attainment at LM Entry	836474	1.972288	0.6271562	1	3
Time-Varying Controls					
Family status: single	836474	0.7444105	0.4361923	0	1
Family status: married	836474	0.2122385	0.4088931	0	1
Family status: divorced	836474	0.043351	0.2036462	0	1
Number of Children	836474	0.1876006	0.4518034	0	5
Number of Month Employed	836474	76.35669	47.91522	1	180
Number of Month in Parental Leave	836474	1.435648	7.729832	0	157
Number of Month Unemployed	836474	1.598706	6.924099	0	165
Number of Month in Additional Education	836474	5.334424	14.54156	0	169
Employed as public official	836474	0.0499095	0.2177581	0	1
Selfemployed	836474	0.0046565	0.0680792	0	1

Data: NEPS SUF, SC6 D-5.1.0; own calculations

Appendix 4.2 Sample Descriptive for Dropping Out of Leadership

	Obs	Mean	Std. Dev.	Min	Max
Explanatory Variables					
Month of Observation	50892	115.671	44.742	1	180
Gender (male=1)	50892	0.742	0.438	0	1
Gender-type of Occupation: female	50892	0.080	0.272	0	1
Gender-type of Occupation: mixed	50892	0.315	0.465	0	1
Gender-type of Occupation: male	50892	0.605	0.489	0	1
Time-Constant Controls					
Cohort: 1944 - 1955	50892	0.352	0.477	0	1
Cohort: 1956 - 1965	50892	0.404	0.491	0	1
Cohort: 1966 - 1975	50892	0.244	0.430	0	1
Born in Germany	50892	0.894	0.308	0	1
Age at LM Entry	50892	23.047	3.676	15	35
Highest Education Attainment at LM Entry	50892	2.169	0.650	1	3
Time-Varying Controls					
Family status: single	50892	0.735	0.441	0	1
Family status: married	50892	0.214	0.410	0	1
Family status: divorced	50892	0.051	0.220	0	1
Number of Children	50892	0.113	0.394	0	3
Number of Month Employed	50892	100.983	43.497	1	180
Number of Month in Parental Leave	50892	1.125	6.561	0	157
Number of Month Unemployed	50892	1.753	6.398	0	105
Number of Month in Additional Education	50892	7.871	16.428	0	116
Employed as public official	50892	0.021	0.143	0	1
Selfemployed	50892	0.000	0.022	0	1

Data: NEPS SUF, SC6 D-5.1.0, own calculations

Chapter 5

Overall Conclusion

Despite significant changes of the gender system in the last decades, which are particularly observable with respect to increasing gender egalitarianism and female labour market participation, occupational gender segregation remains a very persistent phenomenon in all Western societies. This segregation of men and women into different occupations is the result of a gender-specific career choice process, which provokes structural disadvantage for women. Therefore, it is important to investigate how occupational choices are constrained and how they affect gender disparities in later working life. Against this background, this dissertation examines how occupational contexts affect individual occupational decisions and following employment trajectories. The overall research question was:

In how far do opportunity structures for 1) the access to and 2) employment trajectories in gendered occupations affect occupational gender segregation and its consequences?

All three subprojects of this cumulative dissertation contribute to answer this question by focusing on the relevance of local opportunity structures as context for the realisation of gendered occupations aspirations (Paper 1) and consequences of gendered occupational choices due to different opportunities within gendered occupations for specific employment patterns (Paper 2) and upward occupational mobility (Pater 3). The following section outlines the central findings, implications and gives suggestions for future research.

5.1 Central Findings

All subprojects examine the relevance of gender-typical occupations. While the first paper analyses how the overall occupational structure on the aggregate-level of regional districts influences adolescent's realistic occupational aspiration, paper two and three focus on the internal structure of gender-typical occupations as a framework that structures employment trajectories. Thus, all subprojects examine the influence of contextual structures providing opportunities or constrains for individual occupational aspirations (Paper 1), employment patterns (Paper 2), and upward occupational mobility (Paper 3).

The overall conclusion is that opportunity structures do affect occupational aspirations and the consequences of gender-specific occupational choices in various respects. The findings of the first subproject show that already occupational aspirations of boys and girls at age 15/16 are influenced by the surrounding occupational structure within their local VET and labour markets. The mechanisms differ for boys and girls, but both do perceive the opportunities for

the realisation of their aspirations. In line with Gottfredson's argumentation, the results support the view that adolescents adapt their occupational aspiration to perceived accessibility. Even if this subproject does not apply a longitudinal approach due to data limitations, it shows that aspirations are not expressed 'freely,' as most previous studies implicitly assume when analysing gendered occupational decisions as result of e.g. (perceived) gender-specific abilities or gender socialisation. Furthermore, that especially the occupational structure of labour markets affect boy's and girl's occupational aspirations, indicate that the long-time perspective of opportunities for later working life seems to be important already at this early age. The finding that girls are most likely to aspire to gender-neutral occupations in regions with low competition for apprenticeships (constrains) further indicate that they are aware of the structural disadvantages in gendered occupations.

The second subproject further contributes to disentangle the individual-level effect of gender and the contextual-level influences of the internal structure of gendered occupation. By comparing typical employment patterns of men in female-typical occupations with those of their female colleagues and those of men in male-typical occupations, the aim of this study is to detect the contribution of occupation-internal opportunity structures promoting gender differentiation in employment patterns. The results show that female- and male-typical occupations differ especially in their opportunities for part-time work. Men seem to be "free" in their choice between part-time and full-time dominated employment patterns in female-typical occupations, but not in male-typical ones. Men in male-typical occupations have nearly exclusively full-time dominated employment patterns. The same is true for men without children in female-typical occupations. However, father's employment patterns in female-typical occupations are more similar to those of mother's in female-typical occupations with respect to part-time work. Thus, employment patterns of men in female-typical occupations seem to mainly reflect a need or preference for a greater work-life-balance when having children.

While study two shows that male-typical occupations do not provide a good work-life balance in form of part-time employment, the third subproject shows that female-typical occupations do not provide many opportunities for promotion, especially not for women. The third study analyses the internal structure of gender-typical occupations with respect to upward occupational mobility and thus contributes to the understanding of how horizontal and vertical gender segregation are interrelated. The results show that female- and male-typical occupations provide also different opportunities for the access to and the continuance in leadership positions, especially for women. However, here the internal structure of female occupations indeed is constraining. Even men are less likely to enter and to stay in leadership in female-

typical occupations compared to men in male-typical ones. However, men in female-typical occupations are less disadvantaged than women in female-typical occupations. In male-typical occupations, there are no significant gender differences in promotion at all. These findings are in line with previous findings from Dämmrich and Blossfeld (2017). Unfortunately, also in this study we were not able to completely control for or to analyse a probable mechanism of (self-)selection with our data.

Taken the insights of all subprojects together, one can conclude that the overall occupational structures as well as the internal structures of gendered occupations are frameworks affecting occupational gender segregation and its consequences. The contextual effects of these structures have to be considered when analysing causes for and consequences of occupational gender segregation.

5.2 Theoretical and Practical Implications

For the purpose of this dissertation my co-authors and I draw on different theories of at least three disciplines. As demonstrated in the first chapter of this dissertation, these theoretical approaches are to a certain extend competing but also supplement each other. While social psychologists offer the most comprehensive and dynamic approach for the developmental process that results in occupational choices, economic and sociologic theories make a larger contribution to a greater understanding of later employment trajectories. However, neither of the two disciplines does provide a systematic explanation for opportunities and constrains of the overall occupational structural and the internal structure of gendered occupations. If the findings of the three subprojects of this dissertation were combined, they suggest an interdisciplinary integration of supplementary explanations extended by explanations for the structural frameworks. This integrative theory of gender segregation would have to capture at least three key aspects: 1) a life-course perspective is necessary to account for the strong path-dependency of educational and occupational decisions; 2) multi-level interactions, where the individuals are nested first of all in their families but also in a local and broader societal context, have to be taken into account; 3) mechanisms differ by gender and thus have to be specified separately for men and for women.

The findings and theoretical implications align with further practical implications for policy making. Especially in Germany, where the internal structures of male- and female-typical occupations stem at least partly from their developmental history and thus seem to reinforce traditional and outdated gender norms, it has to be asked, how these structures can be modernised. The added value of the segregated VET system has to be called into question.

For example, the advantages of the male-dominated dual VET system – such as higher labour market proximity and wages during VET - might be transferred to VET for female-typical occupations. Furthermore, opportunities for a better reconciliation of work and family life have to be implemented in male-typical occupations as well. Initial progress in this respect is already done by recent reforms of parental leave regulations, but can be further extended. Further progress is also needed with respect to part-time opportunities in male-typical occupations. During the current collective bargaining for the male-dominated metal industry, the IG Metall (Industrial Union of Metalworkers) insists on a right to return to full-time employment after a temporal reduction of working time. This so called "Brückenteilzeit" (bridging part-time) aims to establish more opportunities for part-time employment without the fear of not being able to return. However, up to now it remains unclear, how these recent changes affect gender-specific employment patterns.

5.3 Limitations and Suggestions for Further Research

The first subproject of this dissertation assumes that the mechanism of how the occupational structure influences occupational aspirations is a process of adaptation of initial idealistic occupational preferences to perceived accessibility, which leads to (accessible) realistic occupational aspirations. Therefore, further research is needed to assess this mechanism properly in a longitudinal design or experimental study. Furthermore, due to data limitations neither of the subprojects of this dissertation was able to fully control for personal attitudes such as career orientation that may lead to self-selection of specific kinds of men and women in female- or male-typical occupations. However, this would be important, in particular for upward occupational mobility.

The finding of the second subproject that men in female-typical occupations are "free" to chose between gender-typical and gender-atypical employment patterns can have different explanations. One possible explanation is that men in female-typical occupations already broke with traditional gender norms by choosing an atypical occupation and thus are no longer expected to show gender-typical behaviour. Another explanation may be that gender norms do not play any role for male employment patterns and that it's only the internal structure of occupations which provides opportunities for different work arrangements. Alternatively, it can be assumed that men with different preferences for specific employment patterns self-select in male- or female typical occupations. To disentangle preferences from constrains within different structural contexts, it would be necessary to compare preferences for specific employment patterns before occupational choice and their realisation in

subsequent employment trajectories. Thus, it would be interesting to investigate in a first step, if the different employment patterns of men in female-typical occupations result from different preferences for a higher reconciliation of work and family life. In a second, step it would be interesting to examine if these differences already determine occupational choice or if they emerge when working in female-typical occupations, maybe because colleagues serve as role models. Furthermore, it would be necessary to analyse the same for women in male- and female-typical occupations to complement the picture.

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Curriculum Vitae

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Educational Qualification

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10/2006 – 09/2010	Bachelor of Arts (B.A.), Heinrich Heine University Düsseldorf Program "Social Sciences", (including Political Science, Sociology and Media Studies)

Research Experiences

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10/2010 - 02/2012	Heinrich Heine University Düsseldorf Research Associate at the Department „Educational Research and Educational Management"
10/2009 – 09/2010	Heinrich Heine University Düsseldorf Student Research Assistant at the Department „Educational Research and Educational Management"
10/2008 – 09/2009	Institute for Employment Research (IAB) North Rhine-Westphalia Student Research Assistant

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- English (very good knowledge)
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Software skills

STATA, SPSS, R, MPlus, MAXQDA, Citavi, Zotero, Microsoft Office 2010

Conference Presentations

04/2018	BIBB-Tagung Tagung: Abbruch, Umbruch, Aufbruch? Lebensverläufe junger Menschen und Ungleichheit in Ausbildung, Studium und Beruf (LUASB), Bonn „Einflussfaktoren auf die Bildungsentscheidung nach dem Abitur"
04/2017	International Sociological Association - RC28 Spring Meeting 2017, Cologne "Glass Ceilings, Escalators and Revolving Doors: Comparing Gendered Occupational Trajectories and the Upward Mobility of Men and Women in West Germany"
06/2016	International Conference on Sequence Analysis and Related Methods (LaCOSA II), Lausanne "Glass Ceilings, Escalators and Revolving Doors: Comparing Gendered Occupational Trajectories and the Upward Mobility of Men and Women in West Germany"
03/2016	4. Tagung der Gesellschaft für Empirische Bildungsforschung (GEBF), Berlin „Geschlechtsspezifische Erwerbsverläufe - Ein Vergleich der beruflichen Aufstiegsmobilität von Männern und Frauen in West-Deutschland"
03/2015	3. Tagung der Gesellschaft für Empirische Bildungsforschung (GEBF) „Heterogenität.Wert.Schätzen", Bochum „Kontextuelle Einflüsse von Peers und lokalen Ausbildungsmärkten auf geschlechtsuntypische Berufsaspirationen bei Jungen"
02/2015	Winter School on "Differences Matter: Genders in Labour Markets", Universität Trento, Italien "Boys' gender-atypical occupational aspirations - Contextual influences of peers and local labour markets in Germany"
09/2014	European Consortium for Sociological Research (ECSR) Conference 2014 „Social Inequalities in Europe – On the Rise Again?" "Boys' gender-atypical occupational aspirations - Contextual influences of peers and local labour markets"

Publications

Forthcoming	"Glass Ceilings, Glass Escalators and Revolving Doors: Comparing Gendered Occupational Trajectories and the Upward Mobility of Men and Women in West Germany", (co-authored with R. Wise), in: G. Ritschard and M. Studer (Eds.) "Sequence Analysis and Related Approaches: Innovative Methods and Applications"
Revised and Resubmitted	"Gendered occupational aspirations of boys and girls in Germany: The different impact of local VET Markets", (co-authored with Prof. M. Jacob)
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2014	Qualifizierung von An- und Ungelernten - Eine empirische Bestandsaufnahme der Lebenssituation und Potenziale (co-authored with: Dr. R. Flake, L. Middendorf and S. Seyda), IW-Analysen Nr. 100, Forschungsberichte aus dem Institut der deutschen Wirtschaft Köln
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