

Socio-Spatial Boundaries: The Role of Local Contexts for Gender Inequalities in Career Pathways Across Germany

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Abstract

Gender inequalities in career pathways have remained a persistent issue in Western societies, despite some progress over the past decades. Explanations for these inequalities are often sought at the individual or family level. Yet, their extent also varies considerably across local contexts, highlighting the importance of examining how such contexts shape gendered career outcomes—a task taken up in this cumulative dissertation.

Gender inequalities can be explained from a rational choice perspective that highlights decision-making processes, as well as from sociological perspectives that emphasize gendered cultural expectations and beliefs. Over the life course, gender inequalities typically emerge across different stages, three of which I consider in this dissertation: adolescents' gendered aspirations for STEM careers, graduates' gendered earnings at the career start, and parents' gendered career advancement. I argue that dependence on the local context varies by life stage: adolescents and young families are more strongly tied to their local context, whereas graduates face lower costs of mobility. Moreover, different contextual characteristics are likely to matter at different life stages, shaping career outcomes in gendered ways—for instance, through their interaction with prevailing gender-specific occupational images, mobility decisions, and the division of labor in partnerships.

The analyses draw on longitudinal data from the German National Educational Panel Study (NEPS; starting cohorts 3 and 5) and the German Socio-Economic Panel (GSOEP), linked with administrative data from the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) and the Federal Employment Agency (BA) at the district level (NUTS-3). The first study shows that the local prevalence of STEM occupations is reflected in boys' aspirations for STEM careers, particularly non-academic ones, whereas girls' aspirations are largely unaffected and remain lower overall. The second study finds that graduates who leave their place of study for their first job earn higher wages, with gender differences emerging primarily in relation to partnership status: male graduates benefit from spatial mobility mainly when cohabiting with a partner, while female graduates do so only when not tied to a partner. The third study highlights that mothers' career advancement depends much more strongly on local public childcare coverage than fathers': a well-developed and widely used local public childcare

infrastructure reduces the time mothers need to attain wage gains and leadership positions, whereas fathers are affected only when they are not in the traditional breadwinner role.

Together, the studies illustrate the complex role of local contexts in shaping gendered career outcomes, which manifest differently across life stages. The findings imply that contextual effects stem from different mechanisms: For adolescents, local cultural norms and role models appear most relevant, while for graduates and parents, local opportunity structures can open or constrain career options. Moreover, context dependence is particularly pronounced for more vulnerable groups, such as non-academically oriented boys, female graduates in partnerships, and mothers. Overall, the dissertation demonstrates that local structures influence gender-specific career orientations and behaviors. A comprehensive understanding of gender inequalities in career pathways therefore requires systematic attention to differences in local contexts.

Zusammenfassung

Geschlechterungleichheiten in Karriereverläufen sind trotz gewisser Fortschritte in den letzten Jahrzehnten ein dauerhaft vorherrschendes Thema in westlichen Gesellschaften. Erklärungen für diese Ungleichheiten werden häufig auf der Ebene des Individuums oder der Familie gesucht. Ihr Ausmaß variiert jedoch auch erheblich zwischen unterschiedlichen lokalen Kontexten. Dies unterstreicht die Relevanz, genauer zu untersuchen, wie lokale Kontexte geschlechtsspezifische Karriereverläufe prägen – ein Anliegen, dem sich diese kumulative Dissertation widmet.

Geschlechterungleichheiten lassen sich sowohl durch rational-choice-basierte Perspektiven erklären, die Entscheidungsprozesse in den Vordergrund stellen, als auch durch soziologische Ansätze, die geschlechtsspezifische kulturelle Erwartungen und Überzeugungen betonen. Im Lebensverlauf bilden sich Geschlechterungleichheiten typischerweise über unterschiedliche Lebensphasen heraus, von denen ich drei näher betrachte: die geschlechtsspezifischen Aspirationen Jugendlicher für Karrieren im MINT-Bereich, die Einkommensunterschiede von Hochschulabsolvent:innen beim Berufseinstieg sowie die beruflichen Aufstiegschancen von Eltern. Ich argumentiere, dass die Abhängigkeit vom lokalen Kontext je nach Lebensphase variiert: Jugendliche und junge Familien sind stärker an ihren lokalen Kontext gebunden, während Hochschulabsolvent:innen geringere Mobilitätskosten aufweisen. Zudem ist anzunehmen, dass je nach Lebensphase unterschiedliche Kontextmerkmale relevant sind, die Karriereverläufe in geschlechtsspezifischer Weise prägen – etwa durch ihr Zusammenspiel mit vorherrschenden geschlechtsspezifischen Berufsbildern, Mobilitätsentscheidungen und der Arbeitsteilung in Partnerschaften.

Die Analysen basieren auf längsschnittlichen Daten des Nationalen Bildungspanels (NEPS; Startkohorten 3 und 5) sowie des Sozio-oekonomischen Panels (SOEP), die mit Verwaltungsdaten des Bundesinstituts für Bau-, Stadt- und Raumforschung (BBSR) und der Bundesagentur für Arbeit (BA) auf Kreisebene (NUTS-3) verknüpft wurden. Die erste Studie zeigt, dass sich die lokale Prävalenz von MINT-Berufen in den MINT-Aspirationen von Jungen widerspiegelt, insbesondere bei Aspirationen für nicht-akademische MINT-Karrieren, während die MINT-Aspirationen von Mädchen weitgehend unbeeinflusst bleiben und durchgehend niedriger ausfallen. Die zweite Studie verdeutlicht, dass Hochschulabsolvent:innen, die für den Berufseinstieg ihren Studienort verlassen, höhere

Einkommen erzielen, wobei sich Geschlechterunterschiede vor allem in Abhängigkeit vom Partnerschaftsstatus zeigen: Männliche Absolventen profitieren von räumlicher Mobilität insbesondere dann, wenn sie mit einer Partnerin zusammenleben, während weibliche Absolventinnen dies nur tun, wenn sie nicht an einen Partner gebunden sind. Die dritte Studie zeigt, dass die beruflichen Aufstiegschancen von Müttern deutlich stärker von der lokalen Abdeckung mit öffentlicher Kinderbetreuung abhängen als die von Vätern: Eine gut ausgebaute und viel genutzte öffentliche Kinderbetreuungsinfrastruktur im lokalen Kontext verkürzt für Mütter die Zeit bis zu Einkommenszugewinnen und dem Erreichen von Führungspositionen, während Väter hiervon tendenziell nur dann betroffen sind, wenn sie nicht der traditionellen Hauptverdienerrolle nachgehen.

Insgesamt verdeutlichen die Studien die komplexe Rolle lokaler Kontexte bei der Herausbildung geschlechtsspezifischer Karriereverläufe, die sich je nach Lebensphase unterschiedlich manifestieren. Die Ergebnisse deuten darauf hin, dass Kontexteffekte auf unterschiedlichen Mechanismen beruhen: Bei Jugendlichen scheinen lokale kulturelle Normen und Rollenvorbilder besonders relevant, während bei Hochschulabsolvent:innen und Eltern lokale Opportunitätsstrukturen Karrierechancen eröffnen oder einschränken können. Darüber hinaus zeigt sich die Kontextabhängigkeit insbesondere bei vergleichsweise vulnerablen Gruppen – etwa nicht-akademisch orientierten Jungen, weiblichen Hochschulabsolventinnen in Partnerschaften und Müttern. Insgesamt zeigt die Dissertation, dass lokale Strukturen geschlechtsspezifische Karriereorientierungen und Verhaltensweisen beeinflussen. Ein umfassendes Verständnis von Geschlechterungleichheiten in Karriereverläufen erfordert daher eine systematische Berücksichtigung bestehender Unterschiede in lokalen Kontexten.

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A. THEORETICAL AND EMPIRICAL FOUNDATIONS

1. General Introduction

“Gender equality is not only a fundamental human right, but a necessary foundation for a peaceful, prosperous and sustainable world.” (United Nations, 2025a)

In Western societies, a rise in gender-egalitarian values has been observed over the past decades (Boehnke, 2011; Scarborough et al., 2019; Woo et al., 2023). This shift is partly reflected in the United Nations’ sustainable development goals introduced in 2015, which specifically include establishing equality between genders around the world (Leal Filho et al., 2023). In fact, there have been significant global changes in women’s labor force participation (González & Viridis, 2022), and the gender gap in higher education enrollment and graduation has shifted in favor of women (McDaniel, 2012). However, scholars have emphasized that these developments have not translated into full gender equality in work and family life, a phenomenon often described as “stalled gender revolution” (England, 2010; England et al., 2020; Pedulla & Thébaud, 2015). Despite some advances, gender equality in career pathways remains far from achieved (di Bella et al., 2023), leaving the UN’s goal a distant ideal (United Nations, 2025b). This is especially the case as men and women are still found in different occupations and career paths, resulting not only in robust patterns of occupational gender segregation (Charles & Grusky, 2005; Wong & Charles, 2020) but also in relatively persistent gender wage differences (F. D. Blau & Kahn, 2017).

In the concept of a meritocratic society, it is very common to seek explanations of and solutions to these gender inequalities at the individual level by looking, for instance, at ability levels and personal attitudes (Eccles & Wang, 2016). Sociological perspectives have also well established that significant others, such as parents, partners, or peers, are important drivers of individuals’ gendered career pathways (Beckmann, 2025; Hardie, 2015). However, comparatively little attention has been paid to the role of local contexts¹ in shaping gender inequalities (Malin, 2018). The dimension of local contexts is especially relevant, as the amount of gender inequality in career pathways has been shown to vary

¹ When speaking of local contexts in Germany, I refer to administrative districts (*Kreise*) that are equivalent to the Level 3 of the Nomenclature of Territorial Units for Statistics (NUTS-3) developed by the European Union. For more information, see Chapter 4.2.

greatly between regions (di Bella et al., 2023; Fuchs et al., 2021; Hirsch et al., 2013), indicating that the universal ideal of a “peaceful, prosperous and sustainable world” (United Nations, 2025a) is actually confronted in reality with a patchwork of widely varying local context conditions (Detemple & Wicht, 2024; Jappens & Van Bavel, 2012; Kalmijn & Uunk, 2007; Schlager & Hillmert, 2015; Urtasun, 2020).

Local contexts can vary across time and place in their social networks, cultural norms, and opportunity structures (Ellen & Turner, 1997; Friedrichs & Nonnenmacher, 2014; Galster, 2012). Individuals have some flexibility in choosing and extending their local context depending on their age, resources, and stage in the life course, resulting in different dependencies on local contexts and their socio-spatial boundaries (Hillmert, 2008; Kley & Mulder, 2010; Schwanitz et al., 2017). Adolescents are largely tied to their parents’ local context, with little room to deviate (Schwanitz, 2017; Villanueva et al., 2012). By contrast, during transitional phases, such as when graduates enter the labor market, relocation tends to be easier and less costly (Kley & Mulder, 2010). Parents with young children, however, face reduced flexibility, as changes in local context typically affect the whole family (Hillmert, 2008).

With this cumulative dissertation, I aim to bridge the literature on gender inequalities in career pathways (Chesters, 2023; Combet & Oesch, 2019; Katz-Wise et al., 2010; Kleven et al., 2024; Thébaud & Charles, 2018) with research on local context dependencies (Flohr et al., 2020; Hartung et al., 2022; Jewell & Faggian, 2014; Kopečný & Hillmert, 2021; Scherer & Pavolini, 2023). By doing so, I want to contribute to a deeper theoretical understanding of and broader empirical insights into the role of local contexts for gendered labor market inequalities. Specifically, I address the following overarching research question: *In what ways do differences in local contexts and in individuals’ dependence on them influence gender inequalities in career pathways?*

Gender inequalities in career pathways in Germany are manifold and can be expressed by different outcomes and measures. From a life course perspective (Elder, 1994), I argue that inequalities are a multifaceted construct that can emerge in different and potentially reinforcing ways over various stages of life. In this dissertation, I consider three life stage-dependent aspects: (1) adolescents’ gendered aspirations for careers in science, technology, engineering, and mathematics (STEM), (2) gendered earnings of higher education graduates in their first job, and (3) gendered career trajectories of parents measured by wage gains and the attainment of leadership positions. Specifically, the three

empirical studies included in this dissertation address the following life stage-dependent research questions:

- (1) To what extent is the local occupational structure related to gender inequalities in adolescents' aspirations for STEM careers?*
- (2) To what extent is higher education graduates' use of spatial mobility to overcome boundaries of local contexts associated with gender inequalities in earnings at the career start?*
- (3) To what extent does the local public childcare infrastructure contribute to reduced gender inequalities in parents' career trajectories?*

Importantly, fields of work have different levels of pay and prestige, and STEM occupations are, on average, higher paid and more prestigious than other occupations (A. Busch, 2013; Wong & Charles, 2020). Thus, all three outcomes ultimately reflect vertical gender inequalities in career pathways.

This dissertation is structured as follows: Part A (Chapters 1–5) provides the theoretical and empirical foundations. In Chapter 2, I develop a theoretical framework that outlines the relevant theoretical perspectives and assumptions. Following this, I elaborate on the dissertation's relevance and contributions by looking at the three empirical studies included and the overall scope (Chapter 3). Chapter 4 provides an overview of the data used, followed by a summary of the three studies in Chapter 5. The three studies are included in Part B, Chapters 6–8. Part C concludes the dissertation with a general discussion of the findings (Chapter 9), a reflection on their limitations (Chapter 10), and a final chapter outlining implications and providing an outlook (Chapter 11).

2. Theoretical Framework

In this chapter, I present a framework that clarifies the key theoretical perspectives and assumptions underlying this cumulative dissertation. Given the dissertation's specific focus, the chapter elaborates on the life stage-specific role of local contexts and their socio-spatial boundaries for gender inequalities in career pathways. The chapter integrates theoretical arguments and empirical evidence from the literature to develop a comprehensive framework that serves as a basis for my studies.

Like any theoretical approach, the presented framework is at best a valid simplification of a part of reality and does not claim to encompass all potential ways in which local contexts may affect gendered career pathways. My theoretical explanations focus on the supply side, that is, individuals' gendered career-related behavior and decisions. I do not examine demand-side aspects, such as employer behaviors that may include gender discrimination.

The chapter begins with a brief description of the considered life stages and their relevance to gender inequalities in career pathways (2.1). This is followed by an overview of relevant theoretical perspectives on gender inequalities in career pathways (2.2). After that, and central to this dissertation's framework, I analyze the life stage-specific role of local contexts and their socio-spatial boundaries for gendered career pathways (2.3). I end the chapter by summarizing my main general assumptions (2.4).

2.1 Life Stage-Related Gender Inequalities in Career Pathways

The life course perspective in sociological research has gained significant importance in the second half of the 20th century (Elder, 1994; Elder et al., 2003). Its key principles include the importance of historical and contextual time, the interdependence of lives, the timing and social meaning of life events, and the role of human agency (Elder, 1994).

In this dissertation, I broadly build on these foundations. In doing so, I conceive of human agency not as a detached individual choice, but as exercised within structural opportunities and constraints (Elder, 1994; Settersten, 2003). By analyzing different stages across the life course, I am able to provide a more comprehensive understanding of how gender inequalities emerge and unfold over time.

Specifically, I focus on the following three, typically consecutive life stages: adolescents in their school careers, higher education graduates in their transition to the labor market, and parents. The life stages considered cannot fully capture the complexity of gender inequality in career pathways, but they serve as focal points for contrasting the roles of different local contexts. In the following, I outline their theoretical relevance for the emergence of gender inequalities.

2.1.1 Adolescence

The first life stage I consider in this dissertation is adolescence. Career choices and trajectories are based to a considerable extent on aspirations that adolescents develop

(Nießen et al., 2022, 2023; Schels et al., 2022). Career aspirations, defined by the occupations adolescents want to achieve (Gottfredson, 1981), form long before actual career choices are made. They remain a long-term predictor of social status even in the careers of people in their mid-thirties (Schoon, 2001; Schoon & Polek, 2011). Depending on the study context, around 30 to 50% of young people take up occupations that correspond to aspirations they have formulated during their school years (Nießen et al., 2022, 2023; Schels et al., 2022).

Research has shown that adolescents' career aspirations are already highly gendered (Charles, 2017; Chesters, 2023; Helbig & Leuze, 2012). According to Gottfredson's (1981) theory of circumscription and compromise, career aspirations develop out of adolescents' occupational images and self-concepts. Children learn about gender roles at a young age and begin to distinguish between male- and female-typed occupations (Gottfredson, 1981). The crucial aspect of Gottfredson's (1981) theory is based on the assumption that occupations dismissed earlier in life (e.g., due to perceived gender inappropriateness) are unlikely to be reconsidered later in life.

Conceptually, idealistic and realistic career aspirations can be differentiated (Gottfredson, 1981). Idealistic aspirations primarily reflect adolescents' preferences expressed as desired occupations and dream jobs. Realistic aspirations mainly reflect expectations or plans that take into account adolescents' perceptions of job accessibility. In practice, idealistic and realistic career aspirations of adolescents may often be similar (Beal & Crockett, 2013). Nevertheless, idealistic aspirations can be particularly informative when it comes to addressing career aspirations at an early age, while realistic aspirations may be more relevant when focusing on approaching occupational decisions (Beal & Crockett, 2013; Miyamoto & Wicht, 2020; Schels et al., 2022). Because career aspirations are already gendered at a young age (Gottfredson, 1981), examining early idealistic aspirations may help address the roots of gendered career orientations.

One highly segregated field of work in which adolescents develop gendered career aspirations is STEM (Beckmann, 2021; Charles, 2017; Hägglund & Leuze, 2021). The STEM field represents many prestigious and highly paid occupations with relatively good career opportunities (Anger et al., 2025; Fayer et al., 2017; Webber, 2014), which is why segregation in STEM occupations also contributes to gender differences in wages (Bol & Heisig, 2021). Adolescents' STEM aspirations are therefore a relevant research topic when studying the roots of gender inequalities in career pathways.

2.1.2 Graduation from Higher Education

Graduation from higher education represents the second life stage I consider in this dissertation. It is typically characterized by the transition into the labor market, requiring graduates to make far-reaching decisions about their first job (Gebel, 2019). Among graduates, the highly gendered fields of study often translate into similarly gendered fields of work, as indicated by comparatively low horizontal mismatch rates among graduates, the level of which depends on how mismatch is defined (Somers et al., 2019; Verhaest et al., 2017). This implies that the main selection into occupational fields happens earlier in the life course, such as when individuals develop career aspirations and make educational decisions (Charles, 2017; Charles & Bradley, 2009).

However, graduates' transitions into the first job open up gender differences in earnings. Empirical evidence shows that male graduates achieve higher average earnings than female graduates already at the beginning of their careers (Combet & Oesch, 2019; García-Aracil, 2007; Triventi, 2013). It also shows that the gender wage gap among graduates can be decomposed along many different dimensions, with employment characteristics and the number of working hours being particularly important (Triventi, 2013). The gap differs by graduates' field of study as well and is therefore partly related to patterns of horizontal segregation (García-Aracil, 2007; Triventi, 2013).

Transitioning from higher education to the labor market is a phase of upheaval that often goes along with residential decisions (Hillmert, 2008; Kley & Mulder, 2010; Krabel & Flöther, 2014). Thus, the extent to which the use of spatial mobility plays a role in the gender wage gap among graduates is a relevant avenue of research (Comunian et al., 2017).

2.1.3 Parenthood

The third life stage I consider in this dissertation is parenthood. In Western societies, many individuals postpone the transition to parenthood, and those who do become parents tend to exhibit higher levels of economic stability and income on average (Alderotti et al., 2021; van Wijk & Billari, 2024). Consequently, parents represent a socially and economically selective group.

Becoming a parent is a significant life event that often has tremendously different consequences for men's and women's careers (Angelov et al., 2016; Goldin, 2022; van Winkle & Fasang, 2020). Since the timing of parenthood often falls within individuals' early

career stage (Mills et al., 2011; Panova et al., 2017), the consequences of parenthood can be expected to become especially visible in gendered patterns of career advancement and stagnation (Cukrowska-Torzewska & Lovasz, 2020; van Winkle & Fasang, 2020).

Women face significant motherhood penalties in their careers, often leaving the workforce for extended periods and returning to work with reduced working hours (Budig et al., 2012; Kleven et al., 2024). In contrast, fathers usually do not experience negative career consequences from becoming parents. Some empirical studies even suggest the existence of a fatherhood premium, indicating that fathers may benefit from having a child by receiving higher earnings (Hodges & Budig, 2010; McClintock & Shafer, 2025). However, research also indicates that these benefits are largely or fully explained by selection mechanisms, suggesting that men who become fathers differ from other men in ways that would have led to steeper wage growth even if they had remained childless (Mari, 2019).

Compared to other Western countries, motherhood penalties are particularly large and significant in Germany (Kleven et al., 2024). This is related to Germany's conservative, family-centered welfare regime (F. Busch, 2020; Esping-Anderson, 1990), which is reflected in relatively low childcare coverage rates for young children, particularly in the former western part of the country (Zoch & Hondralis, 2017). One central factor in reducing gender inequalities in career trajectories following parenthood is public childcare provision (Bauernschuster & Schlotter, 2015; Zimmert, 2023), which is therefore also a focus of this dissertation.

2.2 Theoretical Perspectives on Gender Inequalities in Career Pathways

Two main theoretical perspectives can be used to explain gender inequalities in career pathways. Economic theories, such as human capital theory and the theory of compensating differentials, assume that men and women differ in their rational, conscious decision-making (Becker, 1962, 1991; Polachek, 1981; Rosen, 1986). In contrast, sociological theories emphasize value-based differences, highlighting the role of cultural beliefs and norms in shaping individual careers (Cech, 2013; Charles & Grusky, 2005;

Ridgeway, 2009; Ridgeway & Correll, 2004).² Both theoretical perspectives are portrayed in the following, beginning with rational choice-based approaches.

2.2.1 Rational Choice-Based Explanations

Human capital theory is an approach that has been widely used to explain patterns of gendered career pathways (e.g., Bian et al., 2024; Comunian et al., 2017; Dlouhy & Biemann, 2018; Leuze & Strauß, 2014). From this perspective, both men and women are expected to make rational decisions about their educational investments based on cost-benefit calculations (Becker, 1962, 1991). These investments can be turned into skills that increase workers' expected productivity and thus their wages. Men and women are expected to differ in their investments, as women anticipate a higher likelihood of employment interruptions associated with parenthood (Becker, 1991).

However, gender differences in educational qualifications alone cannot explain the observed differences in wages, as women, on average, have higher school achievements than men and also dominate in higher education (Conger & Long, 2010; Stoet & Geary, 2020). For this reason, the human capital approach has often been expanded from considering the quantity of human capital to specifically considering its type (Kleinert et al., 2023; Leuze & Strauß, 2016). This implies that women may choose to invest in types of human capital that deteriorate less in the event of employment interruptions (e.g., non-technical fields), which are also paid less on average (Polachek, 1981).

This argument can be further extended by the theory of compensating differentials (Rosen, 1986), which suggests that the wage level of jobs is adjusted for additional job characteristics, such as the compatibility of family and work. Following this perspective, women can make a trade-off and consciously seek occupations and jobs that offer more flexibility in working time arrangements and are less demanding by accepting lower wage levels (Kleinert et al., 2023).

Human capital theory (1991) can also be used to explain couples' division of labor that is relevant for gendered career pathways (Bian et al., 2024; Syrda, 2023). From a household

² Another value-based approach, which is not a focus of this dissertation, is based on devaluation theory. This perspective assumes that a higher representation of women in certain occupations leads to a societal devaluation of these occupations, which is associated with lower pay levels (England, 1992). This perspective is linked to the idea of changing gender compositions within occupations over time and therefore rather describes a macro-phenomenon that is valid independently of individuals' career decisions and behaviors (Kleinert et al., 2023).

economic perspective, it can be a rational decision for women and especially mothers, who often earned less than their partners before entering parenthood, to focus more on domestic work and step back from their careers in order to maximize the family's overall utility (Becker, 1991). Conversely, it can be rational for couples if men and fathers, who often have higher income prospects, focus on providing the main income. As a result of this division, men increase their human capital by gaining work experience that often translates into higher wages (F. D. Blau & Kahn, 2017).

A slightly different angle is provided by bargaining theories, which assume that partners negotiate their division of labor in order to maximize individual utility (Lundberg & Pollak, 1996; McElroy & Horney, 1981). The partner with the higher income prospects has better resources and is therefore in a better bargaining position to avoid domestic work and to concentrate on paid work. Following this, not just rational perspectives on the family utility (Becker, 1991) but also individuals' utility (Lundberg & Pollak, 1996; McElroy & Horney, 1981) will often lead to gender inequalities in career pathways.

However, rational choice-based explanations have been criticized for being too simplistic and for neglecting the role of culturally embedded factors (England, 1992). Furthermore, it is questionable whether career decisions, at least those made early in life, are truly influenced by anticipated family plans and employment interruptions. In fact, empirical research has cast doubt on the idea that young people consciously consider future gendered family roles and labor divisions when making educational and occupational decisions (Cech, 2016; Ochsensfeld, 2016).

2.2.2 Value-Based Explanations

Value-based explanations of gender inequalities often refer to their historical origins (Laqueur, 1992; Osmond & Thorne, 1993). Gendered occupations emerged during the early phase of industrialization at the beginning of the 19th century, together with the concept of wage labor (Rapoport & Rapoport, 1965). At that time, industrialization led to a shift in production work from households to factories, as well as a separation of the work and family spheres (Osmond & Thorne, 1993; Rapoport & Rapoport, 1965). In this context, men were primarily sought for physically demanding and manual production work involving machines (paid work), while women were increasingly confined to family-related tasks (care work). This suggests that gender inequalities in careers are based on differences between men and women that are not universal, but rather, have developed historically and are therefore largely socially constructed (Osmond & Thorne, 1993).

Sociological research relating to gender has often emphasized the facet of its social construction, which is reproduced through individuals' daily behavior and interactions (West & Zimmerman, 1987). Gender is described as a social structure (Risman, 2004) and as a primary frame for social relations (Ridgeway, 2009) that is present as a kind of background identity and shapes how individuals behave and perceive others. Referring to research on social cognition, Ridgeway (2009) emphasizes that categorizations by gender are implicitly made at the beginning of any social relationship. Gender categorizations help to organize and simplify interactions in social relations (Ridgeway, 2009; Ridgeway & England, 2007). This is because these categorizations are closely connected to cultural beliefs about gender, reflecting commonly shared stereotypes about men and women (Ridgeway, 2009).

Although cultural beliefs about gender may at first refer to supposed descriptive differences between men and women, they often turn into status beliefs that assign greater social value and competence to men, thereby transforming such differences into inequalities (Ridgeway, 2006). One common cultural belief has been labeled as "male primacy" (Charles & Grusky, 2005), expressing the idea that men have more authority and are more worthy of status than women (Charles & Grusky, 2005; Ridgeway, 2001). This belief is observable in patterns of vertical gender segregation, which refer to gender differences in hierarchically ranked occupational positions. Overall, gendered status ascriptions may lower women's chances to attain well-paying jobs and leadership positions, thus contributing to persistent gender inequalities in career pathways (Ridgeway, 2001; Ridgeway & Markus, 2022).

Another common cultural belief concerns gender essentialism, reflecting the idea that men and women are fundamentally different and consequently have different interests and competences (Charles & Grusky, 2005). This belief may bias individuals' evaluations of their competence, resulting, for instance, in essentially different beliefs about the mathematical competences of men and women (Correll, 2001, 2004). Moreover, gender-essentialist beliefs can also be expressed in individuals' gendered self-conceptions, as individuals internalize cultural ideals about what kinds of selves, values, and career pathways are appropriate for men and women (Cech, 2013).

According to Charles and Grusky (2005), gender-essentialist beliefs reflect that women are more attached to non-manual work that includes nurturing, interactive, and emotional skills, while men are believed to be better suited to physical labor found in

manual work. Thus, gender-essentialist beliefs are reflected in patterns of horizontal gender segregation, which is the allocation of men and women to different fields of work. These beliefs are also relevant for explaining gender differences in vocational interests and career aspirations (Gottfredson, 1981; Su et al., 2009; Yang & Barth, 2015). Since fields of work differ in their occupational status and prestige, the unequal representation of men and women in these fields often contributes to vertical inequalities (A. Busch, 2013; Wong & Charles, 2020). For this reason, not only vertical segregation but also horizontal differences in occupations are linked to gender-specific inequalities in career pathways, such as wage differences (F. D. Blau & Kahn, 2017; Bol & Heisig, 2021; Triventi, 2013). For example, the higher representation of men in STEM occupations translates into gendered wage inequalities because STEM occupations are on average more prestigious and higher paid than other occupations (Anger et al., 2025; Webber, 2014).

Relatedly, gender-essentialist beliefs regarding care work as a female domain are also reflected in gendered expectations about caregiving roles within families and partnerships (Lindsey, 2020; Schmader & Block, 2025). In contrast to rational choice-based explanations, normative expectations regarding gender roles can explain the gendered division of labor independently of men's and women's resources and income prospects (Nitsche & Grunow, 2016). Especially among parents, cultural beliefs about gendered work and care roles significantly contribute to explaining gender inequalities in career trajectories (Budig et al., 2012; Lindsey, 2020; Lorber, 1994). These beliefs include ideals of motherhood that describe mothers as selflessly devoted, emotionally caring, and closely attached to their children (Lorber, 1994)—an ideology further captured by the concept of “intensive mothering” (Hays, 1996). Ideals of fatherhood may also include aspects of care, yet they place greater emphasis on fathers' engagement in paid work (Dermott, 2014; Höfner et al., 2011), as reflected in the structurally embedded concept of the “male breadwinner” (Lewis, 1992; Pfau-Effinger, 1998). These cultural beliefs and ideals can be relevant in family- and career-related decisions and behaviors, as exemplified by gendered mobility biographies (Abraham et al., 2019; Plyushteva & Schwanen, 2018).

Overall, gender-egalitarian views have been on the rise in Western societies (Pampel, 2011; Scarborough et al., 2019; Woo et al., 2023). These views may partly challenge the logic of male primacy, especially in female-dominated fields of non-manual labor, contributing to reduced, but still existing gender differences in wages (F. D. Blau & Kahn,

2017; Charles & Grusky, 2005). However, beliefs in essential gender differences may persist (England, 2010), since contemporary gender egalitarianism tends to promote equality in outcomes rather than challenging horizontal gender differences in career-related decisions and behaviors (Charles & Grusky, 2005). As outlined, these horizontal career decisions regarding occupational fields and the division of labor often result in wage disparities and unequal career outcomes, making gender-essentialist beliefs a decisive factor in sustaining gender inequalities (Bol & Heisig, 2021).

2.3 The Meaning of Local Contexts for Gender Inequalities in Career Pathways

The idea that understanding individuals' actions and behaviors requires an awareness of regional, time-dependent contexts is not new in sociological research. In fact, it was already embraced by the Chicago School (Abbott, 1997). This perspective also aligns with the principle of life course research on the importance of historical times, which emphasizes the relevance of time and place when studying human behavior (Elder, 1994). Nevertheless, theoretical contributions and research elaborating on the role of local contexts in individuals' career pathways are limited, especially regarding their implications for gender inequalities (Malin, 2018).

In the absence of an overarching theory that explains the potential influence of the local context, I draw on more general knowledge from the literature on regional and neighborhood studies (Bell et al., 2019; J. Crane, 1991; Flohr et al., 2020; Friedrichs & Nonnenmacher, 2014; Galster, 2012; Osikominu et al., 2020; Roberts, 1968; Weßling, 2016). Applying and transferring this knowledge to explaining gender inequalities in career pathways allows me to outline the influencing role of local contexts. As the dependence on local contexts can be expected to differ across individuals' life stages (Hillmert, 2008; Kley & Mulder, 2010), I will do so by separately focusing on adolescents, higher education graduates, and parents.

2.3.1 Implications of the Local Context for Adolescents' Gendered Career Aspirations

Adolescents are typically bound to the local context where they grow up, as pathways out of the parental home usually do not open up before transitioning to adulthood (Schwanitz, 2017). Therefore, it appears plausible that adolescents' behaviors are influenced by socialization processes that encompass perceptions of the local context (Bronfenbrenner, 1979).

The embeddedness in the local context may affect adolescents' career goals and aspirations via role model effects, also referred to in the literature as social network effects (Ellen & Turner, 1997; Friedrichs & Nonnenmacher, 2014; Galster, 2012). Role model effects describe the opportunity for significant others in the local surroundings to provide specific occupational information and resources (Galster, 2012), which can influence their thoughts and behavior regarding career goals (Bell et al., 2019). Hence, if a child grows up surrounded by adults working in the STEM field, it is likely that some of these adults will act as role models and convey STEM-specific knowledge and skills to the child.

Moreover, local contexts may differ in their cultural norms (Henry et al., 2014), and these can be contagious to adolescents via socialization processes, as described by the literature on contagion effects (J. Crane, 1991; Galster, 2012). Contagion effects are closely connected to value-based explanations based on underlying cultural beliefs (Ridgeway, 2009), yet they are expected to vary between local contexts (Galster, 2008). For example, prevailing conservative norms in a local context may lead to more traditional gender-based career expectations (Osikominu et al., 2020). Therefore, if STEM occupations are highly prevalent in a certain local context, this may impact the extent to which adolescents perceive STEM careers as appropriate and normal. This may be reflected in adolescents' occupational images and desired career goals (Gottfredson, 1981).

Besides context-dependent interactions and socialization processes, it can be expected that adolescents adjust their career goals as they get older, based on a more realistic perception of their circumstances (Gottfredson, 1981). Opportunity structure effects, also sometimes referred to in the literature as institutional resources, can be used to describe how opportunities and resources in the local context influence adolescents' career pathways (Galster, 2012; Roberts, 1968). These structures include access to particular types of firms and apprenticeships (Galster, 2012; Roberts, 1968). Local opportunity structures may offer a rational choice-based explanation for local context effects (Breen & Goldthorpe, 1997), suggesting that adolescents perceive local opportunities and adjust their career aspirations accordingly to benefit from local conditions (Malin & Jacob, 2018). For example, if STEM occupations are locally highly prevalent, adolescents can be expected to perceive better access opportunities to these occupations, aligning their career aspirations with local conditions.

Insofar as role models, cultural norms, and opportunity structures are linked to gender-specific occupational images, they can also be expected to have gender-specific effects on young people's career goals. Gender-specific occupational images are formed through socialization processes at a young age (Gottfredson, 1981). As argued, it can be expected that value-based cultural beliefs related to gender essentialism are reflected in these occupational images. To stick with the example of STEM careers, STEM-related role models, cultural norms, and opportunity structures may be more relevant to boys than girls, as STEM represents, from a gender-essentialist view, a typically male field of work (O'Connor et al., 2018; Thébaud & Charles, 2018). Thus, value-based gender-essentialist views may explain how and why the local context shapes career aspirations via social interactions, cultural norms, and perceived opportunities in a gendered way.

A relevant question is whether gender-essentialist beliefs may also vary across local contexts. This is by no means obvious, as cultural beliefs about gender, such as those concerning male- and female-typed occupations, are typically understood as deeply embedded in the broader social structure and are widely shared across Western societies (Charles & Grusky, 2005; Ridgeway, 2009; Risman, 2004). Nevertheless, as described by contagion effects, local contexts may convey different cultural norms and values that shape adolescents' gendered career orientations (Kuhn & Wolter, 2023; Osikominu et al., 2020). Thus, it will be interesting to examine whether gender-related local context structures shape adolescents' gendered occupational images. For example, it would be plausible that STEM careers are more attractive to girls when the STEM workforce is less male-dominated and comparatively more female-dominated (Hägglund & Leuze, 2021).

In addition, there are reasons to assume that disadvantaged and vulnerable groups are more dependent on the structures of their local context (Hartung et al., 2022; Hillmert et al., 2017; Weßling et al., 2015). In the school context, boys may be more vulnerable than girls, as boys consistently show lower school achievement on average (Bayer et al., 2021; Voyer & Voyer, 2014; Yates, 1997). In Germany, this is also reflected in boys being overrepresented in lower secondary school tracks, which offer comparatively more limited opportunities and career prospects (Hadjar et al., 2014; Jürges & Schneider, 2011). Boys with non-academic career prospects may adjust their career aspirations accordingly and may be more sensitive to local opportunities and conditions in the local context (Hartung et al., 2022). In contrast, girls, who often have better school grades and strive towards tertiary education (OECD, 2015), may imagine career pathways outside of their

local context. This gendered pattern of local context dependency may be particularly evident if the local occupational structure aligns with gender-essentialist views of typically male fields of work, such as is the case with STEM occupations (Charles, 2017; Thébaud & Charles, 2018).

2.3.2 Implications of the Local Context for Graduates' Gendered Career Starts

Boundaries of the local context can also be consequential for higher education graduates transitioning to the labor market (Kopecny & Hillmert, 2021). For instance, graduates can benefit in their job search from social networks in the local context (Krabel & Flöther, 2014). Additionally, local opportunity structures, such as the size of labor markets, availability of academic positions, and wage levels, can affect graduates' career opportunities (Kopecny & Hillmert, 2021; Krabel & Flöther, 2014).

However, in contrast to adolescents, higher education graduates have greater flexibility in choosing their place of living (Schwanitz, 2017). In most cases, graduates have already become mobile in the years before, for example by leaving the parental home for their studies or by going abroad during their studies (Kroher et al., 2021). From a life course perspective, higher education graduates are at an important threshold where they can make more independent decisions about their future life (Hillmert, 2008). As graduates have reached the age of majority and are in a stage of transition, changing the local living context may come at lower costs than at other life stages, and is frequently considered and practiced (Haußen & Übelmesser, 2015; Kley & Mulder, 2010).

Moreover, following a human capital perspective, higher education graduates represent a positively selected group in terms of education and career prospects (Venhorst & Cörvers, 2018) for which it is rational to invest in the costs of spatial mobility if career opportunities are favorable in other places (Sjaastad, 1970). Nevertheless, the local context remains important, as a rational actor would only consider the costs of mobility if situated in a local context that is comparatively less advantageous (Hillmert, 2008). Thus, graduates can use their flexibility and readiness to become mobile career-strategically to extend their local context and to have a broader job search horizon (Kidd et al., 2017). They can hence be expected to benefit from mobility by getting access to better paying and more rewarding jobs (Faggian et al., 2007a; Kazakis & Faggian, 2017).

The career-strategic use of spatial mobility, however, may differ between male and female graduates (Comunian et al., 2017). This could be particularly true for mobility

decisions within partnerships and families (Mincer, 1978), assuming that mobility decisions affect both partners and that couples become spatially mobile if they expect higher overall benefits. These higher overall benefits do not necessarily mean that both partners benefit equally, as one partner is usually the “tied mover” (Mincer, 1978). In fact, it is rather unlikely that a new local context provides a significant improvement for both partners (Nisic, 2009), as men and women often depend on different occupational structures, which vary between local contexts (Fuchs et al., 2021).

Male graduates in partnerships can be expected to benefit more from spatial mobility than their female partners for reasons related to both rational choice-based and value-based explanations (Smits et al., 2003). At first, male graduates often have higher income prospects (Combet & Oesch, 2019; Triventi, 2013) and therefore it can be rational for partnered graduates to give more weight to the male partner’s career benefits from mobility (Mincer, 1978). Relatedly, male graduates may often be in a better bargaining position and dominate mobility decisions (Rodman, 1972). However, as outlined, these gendered differences in income prospects may not always be traced back to individuals’ investments in different kinds of human capital (Rosen, 1986), but can also be related to cultural beliefs in men’s primacy in status-worthiness and essentialist views of gender-appropriate types of work (Charles & Grusky, 2005; Correll, 2004; Ridgeway & Correll, 2004).

Additionally, cultural beliefs about gender can affect graduates’ behavior and decisions independently of human capital endowments and income prospects (Ridgeway, 2009; Ridgeway & Correll, 2004). Specifically, internalized gender-essentialist beliefs about paid and care work can be reflected in gendered roles within partnerships (Smits et al., 2003), possibly affecting how partnered graduates prefer to divide work responsibilities. Aligning with the role of the male breadwinner, male partners may give more weight to career-related mobility decisions, whereas female partners may be expected to put their career ambitions on hold (Shauman & Noonan, 2007; Smits et al., 2003).

Based on both rational choice- and value-based perspectives, spatial mobility beyond the boundaries of the local context can be assumed to increase gender inequalities in graduates’ career starts, depending on the partnership situation. The group most sensitive and vulnerable to mobility decisions is partnered female graduates, who may face disadvantageous mobility decisions dominated by their male partner.

2.3.3 Implications of the Local Context for Parents' Gendered Career Trajectories

Compared to children, parents can be expected to have access to a broader local context by extending their perceived socio-spatial boundaries (Schindler & Neely, 2024; Villanueva et al., 2012). Nevertheless, compared to higher education graduates and childless adults, parents are more tied to the local context because their mobility decisions usually affect the entire family (Cooke, 2008). Spatial mobility confronts parents with greater and more complex challenges, which are often associated with higher costs (Hillmert, 2008; Mincer, 1978). This can be expected to restrict parents' flexibility in changing the local context and to increase the potential dependence of their career trajectories on the surrounding local context conditions.

The availability of local public childcare represents an important opportunity structure that enables parents to make rational decisions about when to use public childcare (Steinberg & Kleinert, 2022), thereby contributing to the compatibility of family and work (Bauernschuster & Schlotter, 2015; Zimmert, 2023). Consequently, the public childcare infrastructure has been steadily expanded since the 2000s (Stahl & Schober, 2018). However, its availability still varies widely across local contexts in Germany (Zoch, 2020; Zoch & Hondralis, 2017). This local heterogeneity can be expected to be reflected in parents' career trajectories, as parents will have more time and flexibility to pursue their career goals if they have easier access to public childcare.

There are reasons to assume that mothers are more dependent on the local public childcare infrastructure than fathers. Mothers are often the primary caregivers, reflected in a larger amount of family tasks that limit the time and flexibility they can dedicate to their careers (Bian et al., 2024; Zoch & Heyne, 2023). As a result, mothers stay out of the labor force for longer periods of time and often return with reduced working hours (Kleven et al., 2024; McIntosh et al., 2012), resulting in substantial wage penalties compared to childless women (Budig et al., 2012; Cukrowska-Torzewska & Matysiak, 2020; Kahn et al., 2014). Conversely, fathers are often less involved in family tasks and focus more on their careers (Bünning, 2020). For this reason, becoming a parent usually does not hinder a father's career (Hodges & Budig, 2010; Mari, 2019; McClintock & Shafer, 2025).

Theoretically, parents' unequal division of labor can be explained both by rational choice-based arguments on the overall family utility (Becker, 1991) and value-based arguments on gender-essentialist beliefs about work and care roles (Dermott, 2014; Höfner et al.,

2011; Lorber, 1994; Schmader & Block, 2025). While the gendered division of labor is evident among childless couples, it becomes significantly more pronounced with the onset of parenthood (Büchau et al., 2023; Dunatchik, 2023; Nitsche & Grunow, 2016). Therefore, it can be assumed that mothers, as a vulnerable and disadvantaged group in terms of career progression, are more sensitive to the local public childcare infrastructure (Dujardin et al., 2018; Scherer & Pavolini, 2023; Zimmert, 2023).

Besides the opportunities that the local public childcare infrastructure provides, it may also reflect normative views on the support of public childcare and mothers' role as caregivers (Chung & Meuleman, 2017). For example, in local contexts where public childcare is less available, more conservative values emphasizing women's roles as primary caregivers may often prevail, which can influence mothers' career trajectories (Fervers & Kurowska, 2022). Simultaneously, in these local contexts, mothers may have more friends and acquaintances with conservative values who can serve as role models and who can influence their childcare decisions (Moon et al., 2019).

Moreover, the local public childcare infrastructure may be related to other local opportunity structures, such as the family-friendliness of firms (Simintzi et al., 2025). Overall, it is likely that, besides public childcare, parents' career trajectories also depend on local labor market conditions (Fuchs et al., 2021). For instance, chances for career advancement may be higher in local contexts with larger labor markets and those specialized in certain fields that fit workers' qualifications (Henning & Kekezi, 2023). Because male-dominated occupations often rely on locally clustered firms (Barbour & Markusen, 2007), mothers' and fathers' career trajectories may diverge in ways that reflect the opportunities of local labor markets.

Nevertheless, I assume that the public childcare infrastructure is one of the most important local resources, particularly in the life stage of parents with young children, and is worth studying when aiming to explain gender inequalities in parents' career trajectories. As argued, mothers' career trajectories can be expected to be more susceptible to influence as they are often more involved in childcare. Yet, parents' division of labor does not always follow traditional patterns (Büchau et al., 2023; Zoch & Heyne, 2023). Consequently, the extent to which local public childcare affects parents' career trajectories may depend on how couples divide work and care responsibilities (Bian et al., 2024).

2.4 Summary of Main Assumptions

This dissertation's theoretical framework can be summarized through a series of assumptions, of which the most important ones are illustrated in Figure 2.1. Based on a life course perspective, I assume that gender inequalities in career pathways constitute a multifaceted pattern that unfolds over several consecutive life stages. Each life stage is characterized by different aspects that are relevant to gender inequalities in career pathways. These include, among others, adolescents' career aspirations, graduates' decisions at the start of their careers, and career trajectories after entering parenthood.

I argue that gender inequalities in career pathways can be explained in part by rational choice-based approaches (Becker, 1962, 1991; Lundberg & Pollak, 1996; Polachek, 1981), which point to rational decisions about career investments within partnerships and families. However, I also argue that this explanation is incomplete without considering cultural beliefs about gender that affect men's and women's perceptions and behavior (Charles & Grusky, 2005; Ridgeway, 2009; Ridgeway & Correll, 2004; Schmader & Block, 2025). Differentiating cultural principles such as gender essentialism and male primacy may help to better understand both changes and the persistence of gendered career pathways in Western countries (Charles & Grusky, 2005).

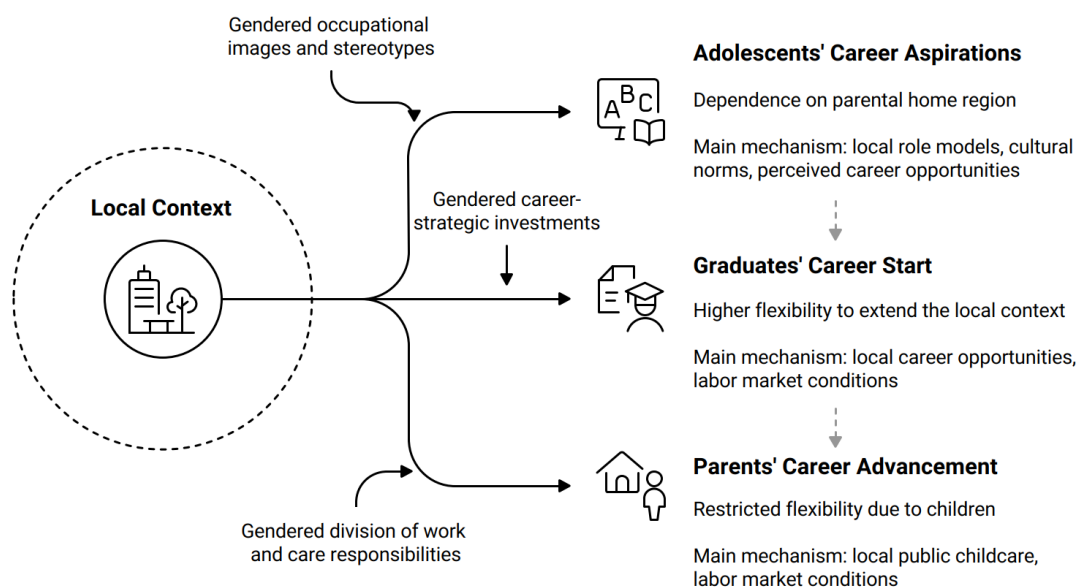


Figure 2.1. Theoretical Model on the Gendered Influence of the Local Context on Career Pathways Across Life Stages.

A central assumption of this dissertation is that local contexts can play an important role in shaping individuals' career pathways. Based on the literature from regional and neighborhood studies (e.g., Flohr et al., 2020; Galster, 2012; Kopecny & Hillmert, 2021; Scherer & Pavolini, 2023), I argue that local labor market opportunities and infrastructures are important, especially when individuals are confronted with actual career decisions, offering a rational choice-based explanation of local context effects. Besides that, I argue that local contexts can exhibit influence via cultural norms that can differ locally and provide a value-based explanation of local context effects, which may be especially relevant in adolescents' socialization processes (e.g., Kuhn & Wolter, 2023; Osikominu et al., 2020). Additionally, local contexts can differ in terms of their individual composition and therefore in terms of access to different social networks and role models (e.g., Bell et al., 2019; Ellen & Turner, 1997; Krabel & Flöther, 2014). This explanation is based on interactions between individuals and can be reflected both in value-based ideals and in rationally usable resources and information (Friedrichs & Nonnenmacher, 2014; Krabel & Flöther, 2014). Overall, I should note that local contexts are not expected to outweigh other important predictors of career pathways, such as individuals' abilities or socialization by parents. Nevertheless, I assume that the local context has an additional effect on individuals that merits investigation.

A further assumption is that individuals depend on local contexts to varying degrees depending on their life stage (Hillmert, 2008; Kley & Mulder, 2010). Whereas adolescents are typically bound to the local context of their parents (Schwanitz, 2017; Villanueva et al., 2012), higher education graduates can be expected to be more flexible in choosing their place of living (Krabel & Flöther, 2014). Local context conditions are likely to be relevant in graduates' decisions on whether and where to move (Kopecny & Hillmert, 2021). Parents' flexibility to become spatially mobile is likely to be restricted due to higher costs considering that mobility decisions would affect the whole family (Mincer, 1978; Nisic & Abraham, 2015). This leads me to assume a potentially higher explanatory value of the local context among adolescents and parents, while spatial mobility beyond the boundaries of the local context may be more relevant among higher education graduates.

Central to this dissertation, I further assume that local contexts shape career pathways in a gender-specific way. For this purpose, I link assumptions on the role of local contexts with theoretical perspectives about gender inequalities in career pathways. Importantly,

I assume that local context effects on gender inequalities do not always point in the same direction or follow the same pattern, but can vary depending on individuals' life stage.

Among adolescents, gendered occupational images acquired through socialization are expected to be the main factor explaining why local labor market structures have a gendered impact on adolescents' early career aspirations (Gottfredson, 1981). As argued, these occupational images reflect gender-essentialist beliefs about typically male and female types of work (Charles & Grusky, 2005; Thébaud & Charles, 2018). This logic can also be applied to aspirations for STEM careers, which are particularly gender-segregated and relevant to vertical gender inequalities. Moreover, gendered characteristics of the local labor market structure, such as the gender composition of STEM workers, may reinforce or challenge gender-essentialist beliefs, thereby shaping adolescents' gendered occupational images and career aspirations.

Among higher education graduates, I argue that career-strategic mobility decisions are shaped by the partnership situation, with male partners' career benefits typically carrying greater weight than those of female partners. The greater emphasis placed on men's career interests might be explained by rational choice-based explanations of household economics (Mincer, 1978), which suggest that the mobility benefits for women often have to make room for the overall benefits within the partnership. However, I also argue that value-based explanations referring to gender-essentialist beliefs about work and care roles and male primacy in career status can explain why female graduates are often found to be the tied, lower-benefiting mover among partnered graduates (Charles & Grusky, 2005; Ridgeway, 2001).

Among parents, I argue that local public childcare can support career engagement, and that its impact on mothers' and fathers' career trajectories is shaped by the gendered division of labor. Couples' division of labor can be a result of rational choice-based career investments and specialization strategies within the family (Becker, 1962). However, the division of labor is also likely to reflect cultural beliefs, such as gender-essentialist views on female care work (Höfner et al., 2011; Schmader & Block, 2025), suggesting that mothers' career trajectories depend more on the local public childcare infrastructure.

Finally, I assume that local contexts may exert stronger effects on more vulnerable groups, while more privileged groups may have greater flexibility and act more independently of local conditions. Compared to girls, boys have on average lower school achievements and lower educational career prospects (Hadjar et al., 2014; Jürges & Schneider, 2011; Voyer

& Voyer, 2014). Female higher education graduates in partnerships are more often expected to be in the role of tied movers, so that they are less free to choose the local context and are more dependent on their partners' local context decisions (Abraham et al., 2010). And among parents, it is often mothers who take over care responsibilities and interrupt their careers (Zoch & Heyne, 2023). Hence, in the context of this dissertation, the most vulnerable groups for which I expect a greater dependency on local contexts are boys, female higher education graduates in partnerships, and mothers.

3. Relevance and Contributions

The extensive body of research on gender inequalities in career pathways provides valuable insights into one of the most persistent societal inequalities (e.g., Bishu & Alkadry, 2017; Guinea-Martin et al., 2018; Netchaeva et al., 2022; Zhou & Shirazi, 2025). This body of research encompasses multiple strands which cover various supply-side factors, including the development of career interests and aspirations, school-to-work transitions, and careers after becoming parents. For this reason, my dissertation can build on a substantial foundation of knowledge from previous studies.

In the following, I elaborate on relevant previous research in greater detail and outline the specific contributions of the three empirical studies comprising this dissertation (Chapters 3.1–3.3). A first overview of the three studies is provided in Table 3.1, including information on authorship and publication status. The chapter ends with a brief general assessment of the overall contributions of this dissertation (Chapter 3.4).

3.1 Studying Local STEM Prevalence and Adolescents' Aspirations for STEM Careers

In the first study, my co-authors and I examine the role of local labor market structures in adolescents' aspirations for STEM careers (Detemple, Weßling, et al., 2025). This topic is a promising starting point for studying gender inequalities in career pathways for several reasons. STEM fields contain many prestigious, well-paid, and in-demand occupations, offering more advantageous career prospects on average than other occupational fields (Anger et al., 2025; Fayer et al., 2017; Webber, 2014). Moreover, the STEM workforce remains largely dominated by men, a circumstance that research has repeatedly highlighted (Thébaud & Charles, 2018; M.-T. Wang & Degol, 2017). This is particularly evident in the STEM subfields of computer science, engineering, and physics (Cheryan et

al., 2017), as well as in non-academic, primarily technical fields (Anger et al., 2021). In general, adolescents' career aspirations, especially those in STEM, are highly gendered (Charles, 2017; Hägglund & Leuze, 2021; Jerrim & Schoon, 2014). Therefore, and because career aspirations are an important predictor of later career choices (Nießen et al., 2022, 2023; Schels et al., 2022), studying adolescents' early STEM aspirations is relevant for understanding upcoming gender inequalities in career pathways.

Table 3.1. Overview of the Empirical Studies of this Dissertation.

No.	Study Title	Authors and Their Contributions	Publication Status
1	Reinforcing Gendered STEM Aspirations: How the Local Prevalence of STEM Occupations Shapes Adolescents' Career Goals	Jonas Detemple ^a (Conceptualization, Methodology, Data preparation, Formal analysis, Visualization, Writing - Original Draft, Writing - Review & Editing) Katarina Weßling (Conceptualization, Methodology, Writing - Review & Editing) Corinna Kleinert (Conceptualization, Methodology, Writing - Review & Editing)	Submitted to an international peer-reviewed Journal (September 2025)
2	Partnerships as Signposts? The Role of Spatial Mobility in Gendered Earnings Benefits of Graduates	Jonas Detemple ^a (single authorship)	Published in Advances in Life Course Research (January 2025)
3	From Playground to Promotion: How Local Public Childcare Shapes Parents' Gendered Career Trajectories	Jonas Detemple ^a (Conceptualization, Methodology, Data preparation, Formal analysis, Visualization, Writing - Original Draft, Writing - Review & Editing) Dominik Becker (Conceptualization, Methodology, Writing - Review & Editing) Katarina Weßling (Conceptualization, Methodology, Writing - Review & Editing)	Submitted to an international peer-reviewed Journal (August 2025)

Note. ^a Corresponding author.

So far, a wide range of studies has looked at gendered STEM aspirations or STEM study choices of young people. Much of this research has examined the relevance of individual-level predictors and highlighted the importance of motivational factors, self-concepts, and gender role attitudes relative to ability (Ahmed & Mudrey, 2019; Dicke et al., 2019;

Eccles & Wang, 2016; Jerrim & Schoon, 2014; Mau et al., 2020; Mulvey et al., 2023; Olive et al., 2022; Riegle-Crumb et al., 2010; X. Wang, 2013). Biased perceptions of math ability and the compatibility of STEM with one's role identity have been identified as decisive predictors of the gendered development and maintenance of STEM career aspirations (Dicke et al., 2019; Eccles & Wang, 2016; Mulvey et al., 2023; Olive et al., 2022).

Additionally, research on STEM aspirations and choices has emphasized the importance of resources, expectations, and support from parents, peers, and schools (Adya & Kaiser, 2005; Beckmann, 2021; Eccles, 2014; Legewie & DiPrete, 2014; Lloyd et al., 2018; Mann et al., 2015). These studies suggest that, during socialization processes, significant others often encourage boys more than girls to pursue STEM subjects, thereby reinforcing gendered interests and career aspirations from an early age (Beckmann, 2021; Eccles, 2014; Legewie & DiPrete, 2014; Lloyd et al., 2018). Although these studies consider contextual factors, they only address the immediate social context. This leaves the role of broader local contexts, such as local labor markets, unclear (Zhou & Shirazi, 2025).

Other studies have suggested that local contexts can have an influence on gendered career orientation by emphasizing local cultural components (Bell et al., 2019; Kuhn & Wolter, 2023; Osikominu et al., 2020). While local conservativeness was only weakly correlated with adolescents having gender-typical career aspirations (Kuhn & Wolter, 2023), men in more conservative municipalities were more attached to STEM studies, whereas women appeared to be largely unaffected (Osikominu et al., 2020). Furthermore, focusing on local cultural role models in the US, Bell et al. (2019) showed that local exposure to innovations and their gender composition can partly explain the underrepresentation of women and disadvantaged youths among American inventors.

Another line of research has examined how differential opportunity structures in local labor markets impact young people's career aspirations and decisions. This research has shown that local occupational structures (Flohr et al., 2020), digitalization of local labor markets (Hickmann et al., 2025), and local unemployment and labor demand (Hartung et al., 2022; Kintrea et al., 2015; Malin & Jacob, 2018; K. Morris, 2025; Theuer & Weßling, 2025) play important roles in shaping adolescents' career aspirations and choices. Some of these studies have incorporated a gendered perspective, using German data from the National Educational Panel Study (Flohr et al., 2020; Hickmann et al., 2025; Malin & Jacob, 2018). Malin and Jacob (2018) found that differences in local occupational opportunities and competition can be important drivers of adolescents' gendered career aspirations.

Hickmann et al. (2025) showed that higher levels of digitalization in the local labor market were associated with males' access to higher-status occupations, but not females'. Furthermore, Flohr et al. (2020) demonstrated that both male and female adolescents were more likely to aspire to occupations dominant in the local labor market.

However, it is unclear whether these findings on local labor markets can be transferred to the STEM field. Based on a comparison of OECD nations, Hägglund and Leuze (2021) suggested that country-level differences in labor market structures, such as the size of service sectors and the share of women in managerial positions, were associated with gendered aspirations for STEM careers. Nevertheless, it is uncertain how these country-level results can be applied to local labor market structures, especially since Flohr et al. (2020) did not find gender-specific differences in the associations with the overall occupational structure of local labor markets. This raises the question of whether the highly gendered STEM structure of local labor markets influences adolescents' aspirations for STEM careers in a gender-specific way, which we address in my first study.

A further contribution of our study is its focus on adolescents in eighth grade (aged 13-14), thereby extending previous research on local labor market effects that has predominantly considered adolescents closer to the end of secondary schooling (Flohr et al., 2020; Hartung et al., 2022; Malin & Jacob, 2018). Adolescents can start vocational training with a lower secondary school degree (*Hauptschulabschluss*) after completing ninth grade in Germany and application processes for training places begin several months before (Kleinert & Jacob, 2019; Protsch & Solga, 2016). Therefore, our study is among the first to explore how local labor market structures shape adolescents' career aspirations before they are expected to engage in the actual decision-making process regarding their future careers.

Moreover, this study's differentiation between academic and non-academic STEM careers is a notable contribution, as previous research on STEM aspirations has rarely done so. Local labor market conditions may be especially relevant for non-academically oriented adolescents (Hartung et al., 2022; K. Morris, 2025), as they may be more bound to the local context than adolescents opting for academic careers (BIBB, 2022; Mulder & Clark, 2002; Weßling & Bechler, 2019). At the same time, it is especially non-academic STEM occupations which have remained a stronghold of gender segregation, as descriptive results from Germany indicated (Anger et al., 2021). In order to better understand how the local occupational structure affects emerging gender inequalities in career pathways,

it is helpful to compare the impact on adolescents' academic versus non-academic STEM aspirations.

3.2 Studying Spatial Mobility and Graduates' Gendered Earnings

In the second study, I examine the transition of higher education graduates to the labor market. Specifically, I look at the extent to which spatial mobility beyond the local context of the study place contributes to gendered earnings in the first job after graduation (Detemple, 2025). Previous research has demonstrated the existence of gender differences in earnings favoring male graduates, even at the beginning of their careers (Combet & Oesch, 2019; García-Aracil, 2007; Reimer & Schröder, 2006; Triventi, 2013). These differences are highly relevant to gender inequalities in career pathways because early career disadvantages often accumulate over years of labor market participation (Atherwood & Sparks, 2019; Fauser, 2020). This is also observable in the gender wage gap, which increases significantly over time, particularly among higher education graduates (Barth et al., 2021).

Graduates must make several career-related decisions, including where to search for jobs (Kopecny & Hillmert, 2021; Krabel & Flöther, 2014). The timing and type of these decisions largely depend on whether young people continued with higher education after secondary schooling or chose other options, such as starting an apprenticeship (Gebel, 2019; Kerckhoff, 2003). Compared to other countries, such as the US and the UK, the German education system is highly stratified (Allmendinger, 1989; Kerckhoff, 2001), which results in considerable social divergence in educational pathways (Protsch & Solga, 2016). While the apprenticeship system has remained an attractive alternative to higher education in Germany, educational expansion has notably improved labor market prospects for higher education graduates (Reimer & Pollak, 2010), with the majority of young people now entering the higher education system (Autor:innengruppe Bildungsberichterstattung, 2024).

Overall, higher education graduates constitute a positively selected group of young people with respect to social background, human capital, and career prospects (Brunello & Rocco, 2017; OECD, 2023; Venhorst & Cörvers, 2018), who can be expected to be more ready to invest in mobility beyond local contexts (Sjaastad, 1970). Those graduates who are flexible about changing their local context can benefit from spatial mobility by accessing more and better-paying jobs (Kidd et al., 2017). Investigating spatial mobility

among graduates is relevant because individuals at this life stage are generally less bound to their local context (Hillmert, 2008; Kley & Mulder, 2010). This provides a unique opportunity to study how crossing socio-spatial boundaries may impact gender inequalities in career pathways.

Studies from the US, UK, the Netherlands, and Denmark have shown that graduates often use spatial mobility to attain higher earnings (Comunian et al., 2017; Jewell & Faggian, 2014; Kazakis & Faggian, 2017; Kidd et al., 2017; Mitze & Javakhishvili-Larsen, 2020; Venhorst & Cörvers, 2018). Most of these studies indicated the need to distinguish between different types of mobility: While moving to a new place was associated with higher earnings, especially among graduates who moved repeatedly (e.g., before and after their studies), returning to one's parental home was linked to lower earnings compared to graduates who remained in the place where they studied (Comunian et al., 2017; Jewell & Faggian, 2014; Kazakis & Faggian, 2017; Kidd et al., 2017).

Yet, it remains unclear whether graduates who become spatially mobile constitute a positively selected group with higher human capital resources who would have achieved higher earnings regardless of their mobility decisions. Using an instrumental variable approach, Venhorst and Cörvers (2018) found no evidence of mobility benefits beyond selection mechanisms. Similarly, Kazakis and Faggian (2017) reported substantial differences in results between general linear models and multinomial treatment models, implying that mobile graduates are positively selected. In contrast, other studies have indicated that mobility benefits persist even after accounting for compositional differences, employing a large set of control variables (Comunian et al., 2017; Kidd et al., 2017), propensity score matching (Jewell & Faggian, 2014), and an instrumental variable approach (Mitze & Javakhishvili-Larsen, 2020).

Contributing to the existing international literature, my study examines graduates in Germany and considers four different types of mobility by distinguishing between graduates who stay at the place of study, return home, or move to a new place within or beyond a 90-minute car-driving radius. Using entropy balancing weights (Hainmueller, 2012), I ensure that the means, variances, and skewness of a large set of individual variables are the same between groups of mobile graduates and those staying at their study location. Additionally, I control for relevant characteristics of the local study context. Thus, my study contributes to the question of mobility benefits beyond selection mechanisms.

My study's relevance for understanding gendered inequalities in career pathways arises from the question of whether male and female graduates differ in their career-strategic use and benefits of spatial mobility. Studies from the US, UK, and Germany examining married or partnered individuals have shown that mobility decisions often hinder women's careers (R. Crane, 2007; Kley & Drobnič, 2019; McQuaid & Chen, 2012; Nisic, 2009; Nisic & Abraham, 2015; Rapino & Cooke, 2011). Specifically, women's mobility is often constrained by family responsibilities and their partners' career preferences (Nisic & Abraham, 2015). This is reflected in shorter commutes (R. Crane, 2007; McQuaid & Chen, 2012; Rapino & Cooke, 2011), low benefits from changing the local context (Nisic, 2009), and delayed or reduced labor market reentry after relocation (Kley & Drobnič, 2019). Studies including men in their analyses have shown that men benefit significantly from longer commutes (R. Crane, 2007; McQuaid & Chen, 2012; Rapino & Cooke, 2011). However, this line of research has not focused on individuals at the beginning of their careers, making its applicability to higher education graduates unclear.

In contrast, research on the mobility benefits of higher education graduates has often lacked a gendered perspective (Jewell & Faggian, 2014; Kazakis & Faggian, 2017; Kidd et al., 2017; Mitze & Javakhishvili-Larsen, 2020). Therefore, evidence on gendered mobility benefits among graduates is rather scarce and ambiguous. Comunian et al. (2017) found that male UK graduates who became mobile before and after their studies had higher earnings than their female counterparts; however, no gender differences were evident for other types of mobility. Venhorst and Cörvers (2018) also found mixed results. While a linear regression model showed higher earnings for male graduates, instrumental variable models showed no significant mobility benefits for either gender (Venhorst & Cörvers, 2018).

My study aims to shed light on the extent to which spatial mobility contributes to the gender wage gap among graduates. By bridging knowledge from previous research on married and coupled women with the research field of graduates' mobility, I argue that graduates' mobility benefits may become gendered once graduates are in steady partnerships. By analyzing the extent to which graduates' gendered mobility benefits depend on whether graduates have a cohabiting partner, this study offers a new perspective on the existing literature. Thus, the study addresses the question of whether graduates' opportunities to extend their local context have implications for gender inequalities in early career pathways.

3.3 Studying Local Public Childcare Coverage and Parents' Career Trajectories

In the third study, my co-authors and I examine the role of local public childcare coverage in shaping parents' long-term career trajectories (Detemple, Becker, et al., 2025). Entering parenthood significantly increases gender wage differences, as women often face comparatively large motherhood wage penalties (Cukrowska-Torzewska & Matysiak, 2020; de Linde Leonard & Stanley, 2020; Kahn et al., 2014; Stücker et al., 2024). Public childcare has been politically promoted to increase the compatibility of family and work (Zoch & Hondralis, 2017). However, in Germany, coverage has been comparatively low for many years and still does not meet parents' demands in many local contexts, especially for children below the age of three and in western Germany (Meiner-Teubner et al., 2024). Given its local context dependency, the availability of public childcare can be expected to play a key role in how local contexts shape parents' gendered career pathways.

So far, one important strand of research has looked at differences in time, marked by the introduction of major childcare and family policy reforms (Bauernschuster & Schlotter, 2015; Bettendorf et al., 2015; Gangl & Huber, 2025; Geyer et al., 2015; Zimmert, 2023). These studies have focused mainly on changes in maternal labor force participation, showing that they largely depend on the institutional setting, the time frame, and the specific type of reforms that occurred in the observation period. They consistently demonstrated that when reforms were implemented to improve public childcare infrastructure and family-friendliness, mothers' labor force participation increased. Yet, most of the aforementioned studies on policy interventions have either not accounted for heterogeneity in the local public childcare coverage (Bauernschuster & Rainer, 2012; Bettendorf et al., 2015; Geyer et al., 2015) or have not modeled the specific influence of local differences (Gangl & Huber, 2025). A notable exception is the study from Zimmert (2023), which examined maternal labor force participation in Germany before and after the childcare reform of 2013. The study showed that mothers in local contexts with a high public childcare expansion during the reform period were more likely to be employed and to work longer hours than their counterparts in other local contexts (Zimmert, 2023).

Another range of studies has specifically examined local differences in public childcare infrastructure, covering various countries such as the US, Germany, Italy, the Netherlands, Belgium, Denmark, and Japan (Brilli et al., 2016; Dujardin et al., 2018; Hofferth & Collins, 2000; Kalíšková & Münich, 2023; Scherer & Pavolini, 2023; Simonsen, 2006; van Ham &

Mulder, 2005; Zhang & Managi, 2021; Zoch, 2020; Zoch & Hondralis, 2017). This research has shown quite consistently that higher local public childcare coverage is associated with increased maternal labor force participation after childbirth. This consistency remains despite differences in study designs and measures, such as whether local public childcare was measured at the district level (Brilli et al., 2016; Büchel & Spieß, 2002; Zoch & Hondralis, 2017), the municipality level (Dujardin et al., 2018; Kalíšková & Münich, 2023; Simonsen, 2006; Zhang & Managi, 2021), the county level (Hofferth & Collins, 2000), or by defining individual areas of geographical access (van Ham & Mulder, 2005).

However, less is known about the long-term career implications of local public childcare for both mothers and fathers (Chhaochharia et al., 2017; Krapf et al., 2021), highlighting the need for further research. So far, Chhaochharia et al. (2017) found that, in Germany, mothers living in local contexts with high public childcare coverage were not only more likely to work longer hours, work full-time, and remain in the workforce, but also experienced a significantly smaller earnings penalty and were more likely to attain leadership positions, considering a five-year period after childbirth. Although the study used a rich data source in the form of linked employer-employee data from the Institute for Employment Research (IAB), it is important to compare the results with survey data containing further relevant information about individuals and their household compositions.

Moreover, to evaluate the impact of local public childcare on gender inequalities in career trajectories, it is crucial to compare the outcomes of mothers and fathers. Krapf et al. (2021) adopted this approach, showing that mothers in the Canton of Bern, Switzerland, who lived in municipalities with longer-established public childcare systems experienced smaller wage penalties during the six years following the transition to parenthood. Conversely, fathers in these municipalities tended to have smaller wage increases than fathers living in other areas. Thus, effects on overall household income were not observable, while female earnings shares tended to be slightly higher (Krapf et al., 2021). However, the robustness of the case study findings and their transferability to local contexts in Germany remain unclear. This is especially because the measure of local public childcare used in the study captures only the time since the first childcare facility was established in a given municipality, rather than the actual coverage.

With the third study, my co-authors and I aim to contribute to the existing knowledge by examining the time it takes mothers and fathers to achieve career advancement after

entering parenthood and how this relates to local public childcare coverage. We employ an event history approach (Blossfeld et al., 2019), which allows for modeling the timing and likelihood of career advancement over an extended period following the transition to parenthood. We measure parents' career advancement by considering monthly wage gains, hourly wage gains, and the attainment of leadership positions, thus providing a differentiated and comprehensive perspective on parents' career trajectories. By examining long-term implications of up to fifteen years (2006–2021), the study contributes to previous research on the impact of local public childcare that has mainly focused on mothers' more immediate labor force participation after childbirth. Moreover, we contribute to the understanding of gendered career benefits of local public childcare, as most previous research has exclusively focused on mothers.

Another contribution of the study lies in its focus on heterogeneous benefits depending on the division of labor within households. While mothers often remain the primary caregivers (Zoch & Heyne, 2023), the extent to which paid and unpaid work is divided can differ between couples (Syrda, 2023) and is reflected in the division of labor after entering parenthood (Bian et al., 2024). It is possible that mothers' and fathers' career advancement is differently sensitive to local public childcare depending on the extent to which parents are involved in paid work more equally. Cross-country findings suggest that the division of labor between traditional couples became more balanced after entering parenthood in countries with greater availability of public childcare (Bian et al., 2024). However, the division-of-labor-specific implications of public childcare at the local level and in terms of career advancement remain unclear, as previous research has not focused on this aspect. Thus, analyzing heterogeneities in parents' division of labor can help to better understand the impact of local public childcare on gender inequalities in career trajectories, providing relevant empirical insights to the existing knowledge.

3.4 Overall Contributions

Overall, my aim with this dissertation is to generate valuable insights to better understand how local contexts and their boundaries matter for gender inequalities in career pathways. I bridge micro-level research on gendered career pathways and regional-level perspectives on local contexts, thereby extending empirical evidence on gender inequalities in career pathways. I demonstrate that gendered outcomes are not universal but rather shaped by local structures, boundaries, and how individuals interact with them.

By doing so, I also contribute to theoretical debates and offer insights that may inform discussions on policies.

Simultaneously, I extend previous research on the role of local contexts. So far, research on local context implications—which is overall still limited—has often not included a gendered perspective. With my research, I aim to establish a more nuanced understanding of the gender-specific implications of local contexts.

Another important contribution is the comparative analysis of different, typically consecutive life stages. By studying adolescents, higher education graduates, and parents, I underscore that the role of local context and its implications for gender inequalities in career pathways cannot be generalized to a single story. Instead, individuals' boundedness to the local context and the relevance of specific context characteristics can be expected to differ by life stages. Taken together, I provide a multifaceted perspective on the varying role of local contexts for emerging gender inequalities in career pathways.

4. Data Overview

To conduct empirical research, it was necessary to identify suitable and available data sources. To model individuals' life stage-specific career pathways and capture relevant local context characteristics, I combined individual-level data with local context-level data using administrative district identifiers at the NUTS-3 level. These combined datasets provide the opportunity to model the role of local contexts in shaping individuals' gendered career pathways. In the following, I briefly describe and justify the selected individual-level (Chapter 4.1) and context-level data (Chapter 4.2) that I used in my empirical studies.

4.1 Individual-Level Data

For the research goals of this dissertation, it is particularly advantageous to rely on longitudinal survey data, which offer a more robust and reliable empirical basis for capturing time-dependent processes (de Vaus, 2001; Hsiao, 2007). Such data typically include rich information on individuals and their life situations, enabling a detailed analysis of decision-making processes and behavioral patterns. In contrast to purely cross-sectional data, longitudinal data follow individuals over time, allowing researchers to

capture changes and dynamics at different life stages. Moreover, the repeated data collection in panel surveys ensures that time-dependent information is gathered directly from respondents, thereby reducing retrospective recall periods and minimizing potential recall bias. An overview of all individual-level data sources used in this dissertation is provided in Table 4.1.

Table 4.1. Overview of Individual-Level Data Used in This Dissertation.

No.	Study Title	Data	Data Access Used	Data Source
1	Reinforcing Gendered STEM Aspirations? How the Local Prevalence of STEM Occupations Affects Adolescents' Career Goals	National Educational Panel Study (NEPS), Starting Cohort 3 — Grade 5 (SC3)	On-site access at the Research Data Center of LIfBi	LIfBi
2	Partnerships as Signposts? The Role of Spatial Mobility in Gendered Earnings Benefits of Graduates	National Educational Panel Study (NEPS), Starting Cohort 5 — First-Year Students (SC5)	Remote access via RemoteNEPS	LIfBi
3	From Playground to Promotion: How Local Public Childcare Shapes Parents' Gendered Career Trajectories	German Socio-Economic Panel (GSOEP) v38.1	On-site access at the Research Data Center of DIW and at Bielefeld University	DIW

LIfBi = Leibniz Institute for Educational Trajectories in Bamberg

DIW = German Institute for Economic Research

4.1.1 National Educational Panel Study, Starting Cohort 3

For studying adolescents' early aspirations for STEM careers, the National Educational Panel Study (NEPS), Starting Cohort 3 — Grade 5 (SC3) provides a suitable data source (Blossfeld & Roßbach, 2019; NEPS Network, 2024). The study began in winter 2010/11 with a survey of 5,753 fifth graders, their parents, and their teachers. Two years later, in winter 2012/13, the panel was refreshed with 2,146 seventh graders (Steinhauer & Zinn, 2016). The sampling was based on a representative sample of secondary schools in Germany. As part of the study design, students were surveyed at least once a year. The data contain detailed information on relevant student characteristics (e.g., career aspirations, math grades, personality, and type of school attended) and parents' occupations.

Adolescents were first asked about their career aspirations in winter 2013/14, when they were in eighth grade (ages 13–14). The NEPS-SC3 dataset collects this information from adolescents who are one year younger than those in the fourth starting cohort of the NEPS, which begins with ninth graders. This one year can make a big difference in the career decision-making process, as adolescents opting for vocational education and training are often confronted with application processes in ninth or tenth grade, depending on the type of secondary school they attend and the type of vocational training they intend to pursue. As I am interested in explaining early gendered career aspirations and not anticipated decisions, the NEPS-SC3 data are highly suitable. The data also provide information on the administrative districts of the secondary schools that the adolescents attended, and this information was accessible in the scientific use files with the lowest level of anonymization. I accessed this data on-site at the Research Data Center of the Leibniz Institute for Educational Trajectories (LifBi) in Bamberg.

4.1.2 National Educational Panel Study, Starting Cohort 5

For studying higher education graduates' earnings in the first job, Starting Cohort 5 — First-Year Students (SC5) of the NEPS is regarded as a highly suitable data source (Blossfeld & Roßbach, 2019; NEPS Network, 2022). Similar to the third starting cohort, data collection began in 2010 and has been repeated annually. A total of 17,909 first-time enrolled first-year students were sampled from a selection of higher education institutions in Germany, with an oversampling of teacher education students and private institutions (Zinn et al., 2020).

The NEPS-SC5 data provide detailed information on the educational pathways of students and follow them even after they leave the higher education system. The data were assessed directly, rather than being based on retrospective reports, and cover relevant information on individuals during their studies (e.g., status, expectations, grades, cohabiting partners, and field of study) and their career starts (e.g., earnings and working hours). This data format is unique in Germany, making it possible to adequately model career decisions during the transition from higher education to the labor market.

The data also contain information on individuals' places of residence during their studies and during secondary schooling, as well as their places of work. This allowed me to model various types of mobility and distances. I accessed geographical location information at the district level via the remote access technology of the NEPS, using a virtual desktop.

4.1.3 German Socio-Economic Panel

To study parents' career trajectories, I refer to the German Socio-Economic Panel (GSOEP, 2023). The GSOEP is a panel survey that began in 1984 and is representative of private households in Germany. Each year, household members over the age of 17 are surveyed individually, while information on younger household members is assessed indirectly. The sample started with 12,290 individuals over 17 from 5,921 households in 1984 and has been regularly refreshed and extended over time (for a detailed description of the dataset, see Goebel et al., 2019).

The data contain detailed information on individuals' private and working lives (e.g., earnings, occupational position, type of work, and self-rated health) and household composition (e.g., number of children and partners' relative earnings). For this reason, GSOEP data are regarded as highly suitable for studying parents' gendered career trajectories.

For my analysis, I used data version 38.1 of SOEP-Core, including its subsamples, with an observation period from 2006 until 2021. Covering such a long period enables me to restrict the sample to adults who became parents for the first time during the observation period, allowing for a longitudinal analysis of parents' career advancement.

The GSOEP data also provide information on households' locations at the district level, which I use to analyze associations with local public childcare coverage. Data including households' districts are available to guest researchers on-site at the research data center of the German Institute for Economic Research (DIW) in Berlin or at selected access terminals, such as at Bielefeld University.

4.2 Local Context-Level Data

To have a standardized and internationally comparable level of local contexts, I use data at the level of administrative districts (*Kreise*) that correspond to Level 3 of the Nomenclature of Territorial Units for Statistics (NUTS-3) developed by the European Union. In Germany, administrative districts are smaller than federal states (*Länder*) and larger than municipalities (*Gemeinden*). Currently, there are 400 districts, 106 of which are city districts and 294 of which are rural districts. In 2023, districts had an average population of approximately 212,000, ranging from around 35,000 in the smallest district (Zweibrücken) to around 3,782,000 in the largest district (Berlin) (Destatis, 2024). Often,

districts are the smallest regional units for which reliable administrative data are available in Germany.

Table 4.2. Overview of Local Context-Level Data Used in This Dissertation.

Local Context Indicator	Data Source	Data Access Used	Used in Study
Car-driving distances between districts	Federal Institute for Research on Building, Urban Affairs and Spatial Development	Provided on request	Study 2
Female share of STEM employees	Federal Employment Agency statistics	Special evaluation by the Federal Employment Agency	Study 1
GDP per capita	<i>Volkswirtschaftliche Gesamtrechnung der Länder</i> , German Federal Statistical Office	INKAR database	Study 3
Median income level	Federal Employment Agency statistics	INKAR database	Study 2
Population density	<i>Fortschreibung des Bevölkerungsstandes des Bundes und der Länder</i> , German Federal Statistical Office	INKAR database	Study 1, Study 3
Population size	<i>Fortschreibung des Bevölkerungsstandes des Bundes und der Länder</i> , German Federal Statistical Office	INKAR database	Study 2
Public childcare coverage rate for children under 3	<i>Kindertagesbetreuung regional</i> , German Federal Statistical Office	INKAR database	Study 3
Share of conservative voters	<i>Allgemeine Bundestagswahlstatistik des Bundes und der Länder</i> , German Federal Statistical Office	INKAR database	Study 1, Study 3
Share of large companies	<i>Unternehmensregister-System des Bundes und der Länder</i> , German Federal Statistical Office	INKAR database	Study 3
Share of service sector occupations	Federal Employment Agency statistics	INKAR database	Study 2
Share of STEM employees	Federal Employment Agency statistics	Special evaluation by the Federal Employment Agency	Study 1
Unemployment rate	Federal Employment Agency statistics	INKAR database	Study 1, Study 3

Note. INKAR = Indicators, Maps and Graphics on Spatial and Urban Monitoring (German: Indikatoren und Karten zur Raum- und Stadtentwicklung).

Relevant data on German districts stem from multiple administrative data sources. The INKAR database from the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) collects data from the German Federal Statistical Office (Destatis), the Federal Employment Agency (BA), and others (BBSR, 2025). This database offers free access to a variety of local context indicators, such as data on local labor markets (e.g., unemployment rate, median income, gross value added, and the share of service sector occupations), urbanity (e.g., population and population density), vote shares for parties in German federal elections, and public childcare coverage rates.

Information on the local prevalence of STEM occupations is not included in the INKAR database, but was provided instead by the BA as part of a special evaluation (BA, 2022b). This data includes the share of employees subject to social security contributions in STEM occupations per district and the gender composition of these employees, using the BA's KldB-based definition of STEM occupations (BA, 2022a).

All local context-level data that I use in this dissertation are listed in Table 4.2, with details given on data access and data sources.

5. Short Summaries of the Empirical Studies

5.1 Summary of Study 1

In the first study of my dissertation, titled *Reinforcing Gendered STEM Aspirations: How the Local Prevalence of STEM Occupations Shapes Adolescents' Career Goals*, my co-authors and I focus on eighth graders' gendered aspirations for STEM careers as an early predictor of STEM career choices (Detemple, Weßling, et al., 2025). The aim of the study is to provide a nuanced understanding of how STEM-related local labor market structures—specifically the local prevalence of STEM occupations and its gender composition—shape adolescents' gendered STEM aspirations.

Inspired by theoretical arguments from previous regional and neighborhood research (e.g., Flohr et al., 2020; Friedrichs & Nonnenmacher, 2014; Galster, 2012; Roberts, 1968), we argue that the local STEM prevalence may influence adolescents' career aspirations via contact with role models working in STEM, contagious views and norms about STEM occupations, and better perceived access opportunities to STEM occupations. Based on theoretical considerations about the gendered formation of career aspirations (Cech,

2013; Gottfredson, 1981; Ridgeway, 2009; Ridgeway & Correll, 2004), the local STEM prevalence is expected to be more strongly related to boys' aspirations for STEM careers than to those of girls, who often do not perceive STEM as a gender-appropriate career option. We argue that this can change if the local STEM prevalence is more female-dominated, which may especially encourage girls and potentially prevent boys from having STEM aspirations. Moreover, given the highly stratified German education system, girls' and boys' aspirations for non-academic STEM careers may be more sensitive to the local STEM prevalence and its gender composition than their aspirations for academic STEM careers.

Using data from the third starting cohort of the National Educational Panel Study (NEPS-SC3), we measure STEM aspirations based on eighth graders' idealistic career aspirations. The local STEM prevalence is measured by the local share of employees in STEM occupations and the gender composition by the local share of female STEM employees among all STEM employees. We apply logistic regression models with regional and individual controls and estimate average marginal effects (AMEs) of the local STEM prevalence and its gender composition on boys' and girls' STEM aspirations.

Results show that boys are more likely to aspire to STEM careers when living in a local context with a high STEM prevalence, whereas girls' STEM aspirations are largely unaffected. Overall, boys in local contexts with the highest prevalence of STEM employees were 13 percentage points more likely to have STEM aspirations than boys in local contexts with the lowest prevalence. The prevalence of female STEM employees tends to decrease boys' STEM aspirations, however, this is only marginally significant. Moreover, female STEM employees do not increase girls' likelihood of having STEM aspirations, if at all, there is a marginally negative association. Strikingly, the local STEM prevalence is most clearly associated with boys' aspirations for non-academic STEM careers, whereas no significant associations are found for boys' academic STEM aspirations as well as for girls' non-academic and academic STEM aspirations. Robustness checks reveal that boys' non-academic STEM aspirations are more affected by the local STEM prevalence in structurally weak regions of former East Germany.

We conclude that gender differences in STEM aspirations are reinforced by a high local prevalence of STEM occupations. The finding that boys are affected by the local STEM prevalence suggests that local labor market structures can have an early influence on career aspirations. These local labor market structures particularly impact non-

academically oriented boys in disadvantaged regions, a vulnerable group facing otherwise limited career opportunities. Part of the story is also that girls' likelihood for STEM aspirations remains low regardless of the STEM-related local labor market structure. Hence, female role models in STEM may need to be more visible in local labor markets to serve as a potentially compensatory resource for girls' STEM aspirations.

5.2 Summary of Study 2

In my second study, titled *Partnerships as Signposts? The Role of Spatial Mobility in Gendered Earnings Benefits of Graduates*, I focus on higher education graduates' transition into the labor market (Detemple, 2025). Since gender differences in earnings already exist among similarly qualified graduates at the beginning of their careers, the study examines how graduates' local context decisions affect gendered earnings. Specifically, the study asks whether spatial mobility for the first job is associated differently with male and female graduates' earnings, whether graduates' partnership situations may moderate these gendered mobility benefits, and to what extent this contributes to the gender wage gap among graduates.

Following rational choice-based considerations of spatial mobility (Sjaastad, 1970), I assume that graduates who are ready to change their local context have a wider job search horizon, thus improving access to better-paying jobs. Therefore, graduates facing the costs of spatial mobility can be expected to accept these costs as a career-strategic investment and to benefit in terms of higher earnings. Given that graduates are a young and academically oriented group, mobility benefits for earnings may be expected to be similar for male and female graduates. However, based on household economic considerations (Mincer, 1978), power-related bargaining (Rodman, 1972), and gender-essentialist beliefs about work and care roles (Ridgeway, 2009; Schmader & Block, 2025) it is reasonable to assume that mobility decisions are not gender-neutral, especially when graduates are in a steady relationship with a romantic partner. Arguing that male graduates may often dominate career-related mobility decisions over their female partner, the study expects that mobility benefits are reflected in larger gendered earnings differences when graduates cohabit with a partner.

The study uses data from the fifth starting cohort of the National Educational Panel Study (NEPS-SC5). I measure graduate earnings by hourly wages in the first regular job after leaving higher education. Spatial mobility is measured by differentiating the following

types: staying in the district of the study place (reference category), returning to the home place, and starting work at a new place. I further subdivide the latter type into short-distance and long-distance mobility, depending on whether the new location is more than or less than 90 minutes away by car. To account for selectivity in graduates' mobility decisions, I apply entropy balancing weights, ensuring that the distribution of observable explanatory variables is the same across types of mobility. Using these weights along with regional and individual controls, I apply general linear models to predict graduates' earnings.

Results show that overall graduates benefit from short- and long-distance mobility by earning 4–5% higher wages. These benefits differ by gender in that female graduates only benefit from short-distance mobility, whereas male graduates only benefit from long-distance mobility. Decisively, cohabiting with a partner makes further gender dynamics in mobility benefits visible: While female graduates who live without a partner achieve 12% higher wages when becoming spatially mobile, no significant benefit is found for female graduates who cohabit with a partner. In contrast, male graduates benefit only from long-distance mobility when cohabiting with a partner, achieving 14% higher wages. This results in reduced gender wage differences when graduates who become spatially mobile live alone, while they increase when graduates cohabiting with a partner become spatially mobile, especially over long distances.

I conclude that overall gender differences in mobility benefits primarily depend on the type of mobility, but in principle, both male and female graduates often use spatial mobility career-strategically to extend their local context and to reach better-paying jobs. However, when considering the partnership situation of graduates, this picture changes, as graduates in cohabiting relationships tend to make mobility decisions that are beneficial to the career of the male partner, but not to that of the female partner. Expecting that these gender imbalances increase over the career, graduates' partnership-dependent local context decisions can be an important factor in gender inequalities in career pathways.

5.3 Summary of Study 3

In my third study, titled *From Playground to Promotion: How Local Public Childcare Shapes Parents' Gendered Career Trajectories*, my co-authors and I focus on the career advancement of mothers and fathers after entering parenthood (Detemple, Becker, et al.,

2025). Specifically, we examine the extent to which public childcare infrastructure in the local context can help parents advance their careers faster. Moreover, we investigate whether mothers' and fathers' career benefits from local public childcare depend on couples' gender-specific division of labor.

Parents can be expected to make rational decisions regarding the costs and benefits of public childcare (Steinberg & Kleinert, 2022). If public childcare is locally available, parents may use the gained time and flexibility to pursue their career goals, which is why parents can be expected to need less time for career advancement if public childcare is widely available locally. However, it is often mothers who do most of the care work, which can be both explained by household-economic considerations (Becker, 1962) and established cultural beliefs and expectations about mothers and fathers (Höfner et al., 2011; Ridgeway, 2009). Therefore, the local public childcare infrastructure might especially help mothers to combine family and work, whereas fathers can be expected to advance in their careers independently of public childcare. Nevertheless, couples may differ in how they divide work and care tasks (Syrda, 2023). Fathers in dual-earner households can be expected to be more involved in childcare than fathers who correspond to the role of male breadwinners, which is why they may also be more sensitive to the local public childcare coverage. Similarly, mothers in dual-earner households can be expected to benefit more from public childcare than mothers in male breadwinner households who are less attached to the labor market.

We use data from the Socio-Economic Panel from 2006 to 2021, restricting the sample to mothers and fathers who became parents for the first time within the observation period. We measure parents' career advancement in three ways: monthly wage gains of 20% or more compared to the pre-parenthood level, hourly wage gains of 20% or more compared to the pre-parenthood level, and the attainment of leadership positions. The local public childcare coverage is defined as the rate of children under the age of three who attend a public childcare facility in their parents' local district in the year they entered parenthood. In line with previous research (Bian et al., 2024), we define households with male breadwinners as those in which male partners contribute 55% or more to the household income prior to parenthood; otherwise, we assume a dual-earner constellation. We apply Cox regression models to estimate the time it takes parents from entering parenthood until they reach career advancement.

Overall, the results indicate that a higher local public childcare coverage is associated with a shorter time to parents' career advancement: Parents in local contexts with a one standard deviation higher public childcare coverage had 15–23% higher hazards for experiencing a career advancement. Moreover, public childcare benefits are significantly higher for mothers than for fathers with regard to monthly wage gains and the attainment of leadership positions, whereas there are no significant gender differences in the associations with hourly wage gains. Considering couples' division of labor, the results indicate that fathers in dual-earner households tend to benefit more from public childcare for their career advancement than fathers in male breadwinner households. In contrast, this pattern is not evident for mothers—if at all, mothers in male breadwinner households tend to benefit more.

We conclude that local public childcare is not only important for mothers' initial labor force participation but also for their long-term career trajectories. This is even the case for mothers in households with a more traditional division of labor. As public childcare benefits are found much less clearly for fathers, local public childcare significantly contributes to reducing gender inequalities in parents' career trajectories. This highlights the important role of a well-developed public childcare infrastructure that meets parents' demands in the local context.

B. EMPIRICAL STUDIES

6. Study 1: Reinforcing Gendered STEM Aspirations: How the Local Prevalence of STEM Occupations Shapes Adolescents' Career Goals

6.1 Introduction

Adolescence is a formative phase in the life course in which girls and boys develop ideas about their future careers, framed by personal interests, social contexts, and structural conditions (Dietrich et al., 2012; Gottfredson, 1981). These ideas crystallize into career aspirations, which are defined by the occupations that adolescents aim to achieve (Gottfredson, 1981). Career aspirations play a crucial role for educational and career trajectories later in life (Nießen et al., 2023; Schoon & Polek, 2011; Weeden et al., 2020), and they help adolescents to form an identity and a sense of direction for the future (Dietrich et al., 2012; Skorikov & Vondracek, 2011).

Career aspirations are gendered, and especially in the fields of science, technology, engineering, and mathematics (STEM) these differences have been highly persistent over time (Thébaud and Charles, 2018). Since STEM occupations are often prestigious, highly paid, and increasingly in demand (Anger et al., 2025; Fayer et al., 2017; Webber, 2014), it is important to understand the gendered mechanisms that influence adolescents' STEM aspirations in order to promote more gender-equitable career orientation among young people.

The structure of the local labor market is a factor that may influence adolescents' career aspirations, but has received limited attention (Flohr et al., 2020). A high prevalence of STEM occupations in the local living environment may shape local cultural work norms, influence the specific occupational information and resources conveyed through social interactions with adults, and affect adolescents' perceived opportunity structures (Friedrichs & Nonnenmacher, 2014; Galster, 2012; Roberts, 1968). Contextual influences arising from the prevalence of STEM occupations can be expected to be gender-specific, as STEM occupations are typically seen as "male" occupations (O'Connor et al., 2018; Thébaud & Charles, 2018), which is also reflected in the gender composition of STEM workers (Anger et al., 2021). Therefore, the present study asks: *Do the prevalence of STEM*

occupations in the local labor market and its gender composition affect the STEM aspirations of adolescent boys and girls?

There are two strands of research on which this study can draw: the first examines the causes of gendered aspirations and choices in STEM, while the second explores the impact of local labor-market conditions on adolescents' aspirations. However, these two research strands are mostly unconnected. Previous research on gendered STEM aspirations and choices has highlighted the role of individual attributes, such as attitudes, motivation, interest, and achievement (Mulvey et al., 2023; Ochsenfeld, 2016; Polavieja & Platt, 2014; X. Wang, 2013), the role of the immediate family (Chesters, 2023; Hardie, 2015), and the role of peer relationships (Beckmann, 2021; Raabe et al., 2019).

Research on how characteristics of local labor markets shape career aspirations and choices (Flohr et al., 2020; Hartung et al., 2022; Kintrea et al., 2015; Malin & Jacob, 2018; McNeal, 2011; K. Morris, 2025) has shown that differences in perceived local opportunities can have complex and counterintuitive consequences. Adolescents in disadvantaged local contexts do not necessarily have lower aspirations (Kintrea et al., 2015), as a weak local labor market can be an incentive for adolescents to delay entering the labor market and to develop higher-status aspirations (Hartung et al., 2022), and reduce the risk of dropping out of school (McNeal, 2011). Conversely, in local labor markets with high labor demand, the transition into employment is more difficult due to longer job search periods (K. Morris, 2025). Research has also shown that adolescents consider opportunities and competition in the local labor market in their career aspirations (Malin & Jacob, 2018) and align their aspirations with the locally prevailing occupational structure (Flohr et al., 2020). However, these studies have focused on adolescents who are close to graduating from secondary education and are partly already involved in application processes (Flohr et al., 2020; Hartung et al., 2022; Malin & Jacob, 2018). Here, local labor market structures can be expected to influence aspirations through direct feedback from employers, teachers, or career counselors.

Yet, little is known about whether and how perceived local labor market structures affect adolescents' ideas and perceptions of their dream occupations before they are involved in application processes. Importantly, most previous research has not used gender as an analytical lens, so it is unknown whether the local gendered structure of STEM occupations has an impact on adolescents' STEM aspirations. Overall, these issues are

important pieces of the puzzle in understanding the influence of local labor market structures on the persistent gender gap in STEM.

The present study was conducted in the context of Germany, which has several advantages. First, the German education system is characterized by early between-school tracking and pronounced vocational specificity, reflected in a highly developed apprenticeship system, which contributes to the attractiveness of non-academic careers as an alternative to tertiary education (Kleinert & Jacob, 2019; Protsch & Solga, 2016). Using Germany as a case study allows us to focus not only on aspirations for academic STEM careers, but also on those for non-academic STEM careers. Non-academically oriented adolescents are a highly interesting group to study, as they can be expected to be more sensitive to local labor markets than academically oriented young people (Hartung et al., 2022; K. Morris, 2025).

Second, in Germany, career choices are crucial decisions with lasting consequences, as job entry is strongly linked to occupational qualifications and occupational mobility is comparatively low (Longhi & Brynin, 2010). This underlines the importance of studying adolescents' career aspirations as a key predictor of career choice.

Third, the German economy is characterized by a large and significant STEM sector, which is particularly evident in the high share of technical and industrial occupations (World Bank, 2023) and includes many non-academic STEM occupations (Anger et al., 2025). German industry is highly dependent on a skilled workforce and experiences a severe shortage of STEM workers (Anger et al., 2021, 2025; Lichtblau et al., 2013).

Fourth, the German economy shows a high regional heterogeneity in economic strength and prevalence of STEM-oriented firms (Anger et al., 2025; Wolf, 2016), while at the same time, the level of occupational gender segregation is relatively high (Bächmann et al., 2024; Leuze & Strauß, 2016).

Overall, the present study makes three contributions. First, by focusing on eighth graders (age 13–14), it examines the relevance of the local occupational structure in explaining adolescents' gendered career aspirations well before they are confronted with actual career decisions, application processes, and transitions. Second, our study opens a new angle in research on STEM aspirations by examining aspirations not only for academic but also for non-academic STEM occupations. Third, and most importantly, our study is one of the first to examine the extent to which the local prevalence of STEM workers has a

gendered impact on adolescents' career aspirations. In a broader context, the findings contribute to understanding the reasons for the persistent gender gap in STEM.

6.2 Theoretical Background and Hypotheses

6.2.1 The Formation of Gender-Specific Career Aspirations

Sociological theory has emphasized the role of gender as a social structure that both constrains and perpetuates individual choices (Risman, 2004). Gender acts as a primary cultural frame that influences individual behavior (Ridgeway, 2009; Ridgeway & Correll, 2004), beliefs about competences (Correll, 2001, 2004), and beliefs about affinities and interests (Cech, 2013). A prominent example of the pervasive structuring function of gender is the persistent pattern of occupational gender segregation (Bächmann et al., 2024; Charles & Grusky, 2005), which is particularly visible in STEM occupations (Thébaud & Charles, 2018). Empirical evidence consistently indicates that these cultural beliefs about gender are reflected early on in adolescents' career goals and aspirations (Busch-Heizmann, 2015; Chesters, 2023; Clemson, 1981; Schoon & Polek, 2011).

According to Gottfredson (1981), adolescents base their career aspirations on gendered occupational images and self-concepts. From an early age, children learn about gender roles and begin to differentiate between "male" and "female" occupations. Consequently, children evaluate their options in terms of whether they are perceived as suitable for their own gender. This process does not require the endorsement of traditional gender norms, but relies mainly on unconscious gendered self-presentation (Cech, 2013). STEM occupations represent "typically male" fields of work (O'Connor et al., 2018; Thébaud & Charles, 2018). Therefore, while boys learn that STEM occupations are compatible with their gender and later find that these occupations align with their perceived interests and personalities, girls rather learn that these occupations fit less into their set of acceptable occupations (Gottfredson, 1981) and often find these occupations to be incompatible with their self-conceptions (Cech, 2013).

6.2.2 STEM Aspirations and the Local Labor Market

The idea that the structure of the local labor market shapes the behavior and preferences of individuals goes back (at least) to the Chicago School of Sociology (Abbott, 1997). P. M. Blau (1960) and Coleman (1986) also refer to the *contextuality of social structure* and its effects on individuals. These ideas have been advanced and most frequently applied empirically by sociological studies on regional and neighborhood effects. This strand of

research has highlighted several transmission channels, three of which are particularly useful for explaining how local labor market structures can influence adolescents' career aspirations at an early age (Bell et al., 2019; Flohr et al., 2020; Galster, 2012; Osikominu et al., 2020; Roberts, 1968).

First, local labor markets may influence adolescents' aspirations through *role model effects*. In STEM-intensive labor markets, adult role models are more likely to work in STEM fields and may convey specific occupational information and resources that increase adolescents' interest in STEM careers (Bell et al., 2019; Friedrichs & Nonnenmacher, 2014; Galster, 2012).

Second, *contagion effects* describe the idea that prevailing cultural norms in a particular local context are contagious (Galster, 2012). Through socialization processes, local cultural norms regarding the pursuit of STEM careers may influence the range of occupations that appear interesting to adolescents (Osikominu et al., 2020).

Third, *opportunity structure effects* (sometimes described as institutional resources in the literature) refer to the extent to which opportunity structures in the local labor market, such as access to particular vocational schools and types of firms, influence adolescents' access opportunities to particular occupations (Galster, 2012; Roberts, 1968). Adolescents may base their career aspirations on these perceived access opportunities, which vary depending on the prevalence of STEM occupations (Flohr et al., 2020; Malin & Jacob, 2018).

While it can be difficult to identify these channels empirically, they help to build a theoretical understanding. They imply that a higher STEM prevalence in the local labor market is positively associated with the likelihood that adolescents aspire to STEM careers. However, considering how salient cultural beliefs about gender are in society and how they shape adolescents' behaviors, competence beliefs, self-perceptions, and interests (Correll, 2001; Ridgeway & Correll, 2004), it is reasonable to argue that the local STEM prevalence is not equally relevant to girls and boys.

Boys can be expected to be more receptive to STEM-oriented cultural norms and to reflect access opportunities to STEM, whereas girls, who perceive STEM occupations to be incongruent with their gendered self-conceptions (Cech, 2013), may be indifferent to the local prevalence of STEM. Similarly, it can be expected that contact with adult role models in the local context who work in STEM occupations mainly reinforces boys' positive images

of STEM and STEM aspirations. Moreover, the literature suggests that boys are generally more responsive to local labor markets and structural contexts than girls, implying that boys give more weight to perceptions of the local labor market (Furlong et al., 1996; Hägglund & Leuze, 2021; Palffy et al., 2023). Altogether, we assume that the prevalence of STEM occupations in the local labor market is more strongly associated with boys' STEM aspirations than with girls' STEM aspirations (*Hypothesis 1*).

Hägglund and Leuze (2021) argue that despite the traditional view of STEM occupations as masculine, growing up in contexts where more women are visible in STEM occupations may contribute to STEM occupations being culturally perceived as less gender-incongruent and this may be consequential particularly for girls' career aspirations. Thus, apart from the general prevalence of STEM, the gender composition of STEM workers in the local labor market may affect adolescents' cultural beliefs about STEM work and its gender appropriateness (Ridgeway & Correll, 2004). Additionally, women working in STEM can act as role models for girls, strengthening their competence beliefs (Correll, 2001) as well as their affinities (Cech, 2013) in STEM, and reducing perceived risks of discrimination (Ridgeway & Correll, 2004). These assumptions are supported by the findings of Bell et al. (2019), who show that girls are more likely to become inventors when the share of female inventors in their home region is high. In addition, González-Pérez et al. (2020) show in an experimental setting that counter-stereotypical role models can encourage girls to have STEM aspirations.

Conversely, boys' STEM aspirations may be reinforced when the local share of female STEM workers is low, as this reduces the visibility of women in STEM occupations and underlines the masculine image of STEM occupations (Hägglund & Leuze, 2021). Therefore, we expect the gender composition of the STEM workforce to have a gender-differential impact. Specifically, we assume that a higher share of female workers in the local STEM labor market increases girls' likelihood of having STEM aspirations and decreases boys' likelihood for having STEM aspirations (*Hypothesis 2*).

Due to Germany's highly stratified education system and the popularity of non-academic vocational training (Kleinert & Jacob, 2019; Protsch & Solga, 2016), it is reasonable to expect that career aspirations differ based on adolescents' academic orientation. This can also be accompanied by varying degrees of dependence on the local labor market. Previous research has suggested that adolescents with non-academic occupational prospects and corresponding career aspirations are more sensitive to structural

conditions than their academically oriented peers, as they are more likely to seek and find training and employment opportunities within their local context (Hartung et al., 2022; K. Morris, 2025). This is because training positions are typically more available across local contexts (BIBB, 2022). In contrast, students with academic aspirations plan to enroll in tertiary education, and studying often requires leaving the local context (Krabel & Flöther, 2014; Mulder & Clark, 2002), especially since opportunities for tertiary education are often limited locally (Weßling & Bechler, 2019). High-tech and knowledge-intensive occupations, such as academic STEM occupations, are also more spatially concentrated and depend less on industrial structures (Barbour & Markusen, 2007), suggesting that adolescents aspiring to these occupations may expect to become mobile.

In addition, adolescents often embark on non-academic occupations before they reach adulthood, making it harder to imagine careers outside the local context (BIBB, 2022). By contrast, tertiary education typically begins in adulthood and comes with greater freedom to move spatially and live independently (Weßling & Bechler, 2019). Taken together, we assume that boys' and girls' aspirations for non-academic STEM careers are more strongly affected by the prevalence of STEM in the local labor market and its gender composition than their aspirations for academic STEM careers (*Hypothesis 3*).

6.3 Data and Methods

6.3.1 Data

The study used data from Starting Cohort 3 of the German National Educational Panel Study (NEPS-SC3) (Blossfeld & Roßbach, 2019; NEPS Network, 2024). Based on a representative sample of grade 5 students in schools in Germany, data collection started in 2010 and was repeated at least annually until 2022. Our target group comprised students in grade 8 (aged 13–14) from the fourth survey wave, which took place between fall 2013 and spring 2014. Of the original 6,718 students, we excluded students from special-needs schools (390 cases) and students without valid information on the district (617 cases) or on career aspirations (559 cases) (see Appendix, Table A6.1). To avoid further sample restrictions due to missing data in the control variables, we applied multivariate imputation by chained equations (van Buuren & Groothuis-Oudshoorn, 2000). The final analysis sample comprised 5,152 students (2,543 boys, 2,609 girls).

NEPS-SC3 data were linked with administrative district-level data (NUTS-3)³ from the Federal Employment Agency (BA) and the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR). The NEPS sampling strategy, which represents students in secondary schools throughout Germany (Steinhauer et al., 2015), ensured broad coverage of 298 out of 402 German districts.

6.3.2 Variables

To measure early *STEM aspirations*, we focused on idealistic aspirations, as these accurately reflect adolescents' desired career goals. Adolescents were asked: "Imagine you had all the opportunities to become what you want to be. What would be your ideal occupation?" The open-text responses were coded according to the German Classification of Occupations⁴ (KldB 2010, Paulus & Matthes, 2013). Based on the KldB STEM classification (BA, 2022a), we created a dichotomous variable indicating whether career aspirations were within the field of STEM (=1) or not (=0). Because idealistic and realistic, more expectation-based STEM aspirations were highly correlated ($r = .71$), missing idealistic aspirations were supplemented by realistic ones for approximately 4% of the sample, when available. Additionally, available information on aspirations from fall/winter 2014 was used for approximately 10% of the sample. Overall, boys (36%) were more likely to aspire to STEM careers than girls (12%) (see Table 6.1).

To distinguish non-academic from academic STEM aspirations, we contrasted STEM occupations for which vocational training was sufficient with STEM occupations that required tertiary education (Paulus & Matthes, 2013). As shown in Table 6.1, most boys (78%) and girls (92%) aspiring to STEM careers were either academically or non-academically oriented. The remaining STEM occupations required a master craftsman, technician, technical college, or bachelor's degree. Because it was not possible to assess whether adolescents perceived these occupations as academic or non-academic, an intermediate category was used ("highly qualified non-academic STEM occupations"). To test Hypothesis 3, we contrasted clearly identifiable academic and non-academic STEM

³ In the reference year 2013, there were 402 districts (*Kreise*) in Germany, which are administrative units smaller than federal states (*Länder*) and larger than municipalities (*Gemeinden*). Districts had an average of 201,000 inhabitants.

⁴ The German Classification of Occupations (KldB 2010) is a widely used and up-to-date classification of occupational groups that reflects the structure of the German labor market. It is convertible to other occupational classifications, such as the International Standard Classification of Occupations (ISCO-08) (Paulus & Matthes, 2013).

aspirations (see Appendix, Tables A6.2 and A6.3 for detailed results on all three categories).

Table 6.1. Descriptive Distribution of the Variables.

	Boys (<i>N</i> = 2,543)				Girls (<i>N</i> = 2,609)			
	M	SD	Min	Max	M	SD	Min	Max
<i>Dependent variables:</i>								
STEM aspirations (yes/no)	0.36	0.48	0.00	1.00	0.12	0.33	0.00	1.00
Non-academic STEM aspirations (yes/no)	0.14	0.35	0.00	1.00	0.02	0.15	0.00	1.00
Academic STEM aspirations (yes/no)	0.14	0.34	0.00	1.00	0.09	0.29	0.00	1.00
Highly qualified non-academic STEM aspirations (yes/no)	0.08	0.26	0.00	1.00	0.01	0.11	0.00	1.00
<i>Independent variables:</i>								
Share of STEM employees	0.24	0.05	0.14	0.41	0.23	0.05	0.14	0.41
Share of female STEM employees	0.15	0.03	0.08	0.27	0.15	0.03	0.08	0.28
<i>Individual-level controls:</i>								
Math grade	4.26	0.99	1.00	6.00	4.18	0.96	1.00	6.00
Migration background (yes/no)	0.31	0.46	0.00	1.00	0.32	0.47	0.00	1.00
School track:								
Low (ref.)	0.14	0.35	0.00	1.00	0.13	0.34	0.00	1.00
Intermediate	0.41	0.49	0.00	1.00	0.37	0.48	0.00	1.00
High	0.45	0.50	0.00	1.00	0.50	0.50	0.00	1.00
Personality (Big Five):								
Extraversion	3.24	0.95	1.00	5.00	3.69	0.93	1.00	5.00
Agreeableness	2.68	0.82	1.00	5.00	2.97	0.83	1.00	5.00
Conscientiousness	3.09	0.86	1.00	5.00	3.39	0.83	1.00	5.00
Neuroticism	3.35	0.65	1.00	5.00	3.58	0.62	1.00	5.00
Openness to experience	3.38	0.76	1.00	5.00	3.43	0.83	1.00	5.00
Parent information:								
Parent working in STEM (yes/no)	0.14	0.35	0.00	1.00	0.14	0.34	0.00	1.00
Parents' SES	49.58	19.92	11.74	88.96	48.61	19.83	11.74	88.96
<i>Regional-level controls:</i>								
East Germany (ref. West)	0.18	0.39	0.00	1.00	0.18	0.39	0.00	1.00
Unemployment rate	6.51	3.01	1.30	15.20	6.56	2.96	1.30	14.30
Conservativeness	42.47	7.48	27.00	63.50	42.02	7.32	27.00	63.50
Population density	629.30	874.62	36.00	4531.00	633.92	880.78	36.00	4531.00

Note. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency; BBSR – INKAR Database. 20 Imputations.

The *STEM prevalence in the local labor market* was measured by the share of employees in STEM occupations among all employees at the administrative district level (NUTS-3).

We used the same STEM classification as for the dependent variable. For the *gender composition of STEM prevalence in the local labor market*, we used the share of female STEM employees among all STEM employees in the district. The data for both variables were from June 2013 and stemmed from employers' mandatory notifications to social security contributions.

On average, 24% of employees in the German local labor markets worked in STEM fields, 15% of whom were women (see Figure 6.1). STEM-intensive regions were more prevalent in southern Germany, reflecting a higher concentration of industries and better economic conditions (Wolf, 2016). In contrast, eastern and urban regions had higher shares of female STEM employees, which is consistent with other studies (Anger et al., 2021). The share of women working in STEM varied considerably between 8 and 28%, remaining a minority in all German regions. Furthermore, it was negatively associated with the overall share of STEM employees ($r = -.20$), indicating that STEM occupations were, on average, male-dominated in STEM-intense regions.

We considered potential regional confounders that could affect both adolescents' aspirations and the share of (female) STEM employees. An east-west indicator was used to account for the still existing differences in occupational structures between the formerly separated parts of Germany. Local unemployment rates served as a proxy for labor market conditions, population density as a measure of local urbanity, and vote share for the conservative party (Christian Democratic Union, CDU) as a proxy for local conservativeness.

In addition, we used individual controls to account for relevant regional differences in students' composition. This included math grades coded from 6 (very good) to 1 (insufficient), migration background up to the third generation, and personality based on the Big Five inventory, using scores for extraversion, agreeableness, conscientiousness, neuroticism, and openness. Furthermore, the type of secondary school track (low, intermediate, or high) was taken into account, as this determines eligibility for the subsequent educational pathway. To capture differences in socio-economic and STEM family backgrounds, the highest socio-economic status of parents' last reported occupation (Highest International Socio-Economic Index of Occupational Status, HISEI) was included, as well as whether at least one parent worked in STEM.

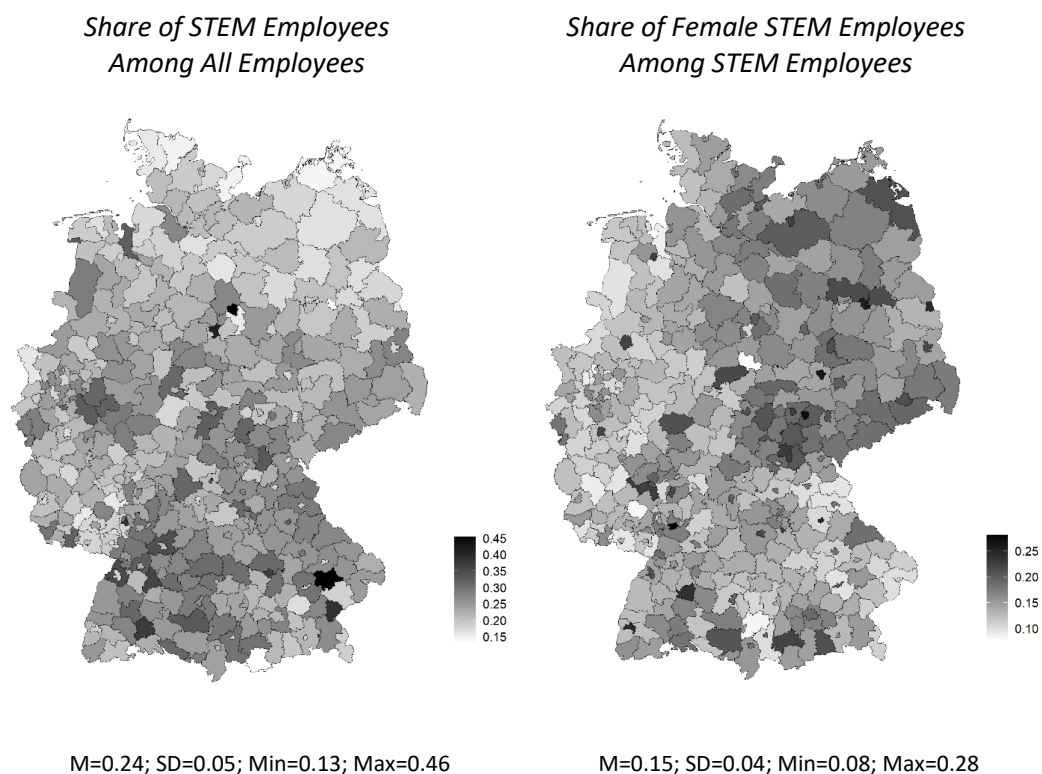


Figure 6.1. Spatial Distribution of the Prevalence of STEM Occupations and Its Gender Composition.

Note. The share of STEM employees relates proportionately to the total number of employees in a district, and the share of female STEM employees relates proportionately to the total number of STEM employees in a district. Both indicators can potentially vary from 0 to 1. Data source: BBSR – INKAR Database.

6.3.3 Analytical Strategy

We calculated logistic regression models to estimate the effects of the local prevalence of STEM and its gender composition on adolescents' STEM aspirations. The use of multi-level models that account for the hierarchical data structure was tested; however, the intra-class coefficient was close to zero, indicating that a parsimonious model without level-2 variance component at the district level was sufficient (Snijders & Bosker, 2011). Instead, cluster-robust standard errors at the district level were included in all analyses to account for potential similarities between adolescents within districts. We reported average marginal effects (AMEs) to simplify the interpretation of effect sizes and to ensure robustness to unrelated unobserved heterogeneity (Mood, 2010). All metric variables were standardized (mean = 0, standard deviation = 1).

The main models followed a three-step approach: (1) bivariate associations; (2) inclusion of regional controls; (3) inclusion of individual controls. This structure allowed us to assess the stability of associations between the (female) share of STEM employees and STEM aspirations across different model specifications. Separate models were estimated for the share of STEM employees and its gender composition to avoid problems of intercorrelation. We also estimated separate models for boys and girls, based on self-reported gender, to test our gender-specific hypotheses. Finally, we estimated separate models for non-academic and academic STEM aspirations to test Hypothesis 3.

6.4 Results

6.4.1 The Local Share of STEM Employees and Associations with STEM Aspirations

Table 6.2 shows the predicted average marginal effects of STEM employees in the local labor market on eighth graders' aspirations for STEM careers (see Appendix, Table A6.4 for full models). The share of STEM employees was positively associated with boys' STEM aspirations. This association remained robust after controlling for potential regional and individual confounders (model 1–3, $AME = .02$, $p < .05$).

Table 6.2. Average Marginal Effects (AMEs) of the Share of STEM Employees Predicting Idealistic STEM Aspirations for Boys and Girls.

	Boys					
	Model 1		Model 2		Model 3	
Share of STEM employees	0.02*	[0.01]	0.02*	[0.01]	0.02*	[0.01]
Regional controls			✓		✓	
Individual controls					✓	
<i>N</i>	2,543		2,543		2,543	
	Girls					
	Model 1		Model 2		Model 3	
Share of female STEM employees	0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]
Regional controls			✓		✓	
Individual controls					✓	
<i>N</i>	2,609		2,609		2,609	

Note. Regional controls: East Germany, population density, unemployment, conservativeness. Individual controls: math grades, intermediate school track (ref. low), high school track (ref. low), extraversion, agreeableness, conscientiousness, neuroticism, openness to experience, migration background, parent working in STEM, parents' SES. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency; BBSR – INKAR Database. 20 Imputations.

* $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

The magnitude of the association was not negligible: The likelihood of boys having STEM aspirations increased by 2 percentage points with a one standard deviation increase of

the share of STEM employees in the local labor market. In local labor markets with the highest STEM prevalence, boys were 13 percentage points more likely to have STEM aspirations than in local labor markets with the lowest STEM prevalence. In contrast, girls' STEM aspirations were not associated with the local share of STEM employees. Hence, the results supported Hypothesis 1.

6.4.2 The Local Share of Female STEM Employees and Associations with STEM Aspirations

Table 6.3 shows the predicted average marginal effects of the share of female STEM employees in the local labor market on STEM aspirations (see Appendix, Table A6.5 for the full models). For boys, a negative association was found, indicating that boys were less likely to have STEM aspirations in local labor markets with a higher share of women working in STEM. When controls were included, this association was significant only at the 10%-level, but its magnitude remained substantial (model 2–3; $AME = -.02$; $p < .10$). For girls, the association did not reach significance in models 1 and 2, but was found to be marginally negative in model 3, after adding individual controls ($AME = -.01$; $p < .10$).

Table 6.3. Average Marginal Effects (AMEs) of the Share of Female STEM Employees Predicting Idealistic STEM Aspirations for Boys and Girls.

		Boys					
		Model 1		Model 2		Model 3	
Share of female STEM employees		-0.02*	[0.01]	-0.02 ⁺	[0.01]	-0.02 ⁺	[0.01]
Regional controls				✓		✓	
Individual controls						✓	
<i>N</i>		2,543		2,543		2,543	
		Girls					
		Model 1		Model 2		Model 3	
Share of female STEM employees		-0.00	[0.01]	-0.01	[0.01]	-0.01 ⁺	[0.01]
Regional controls				✓		✓	
Individual controls						✓	
<i>N</i>		2,609		2,609		2,609	

Note. Regional controls: East Germany, population density, unemployment, conservativeness. Individual controls: math grades, intermediate school track (ref. low), high school track (ref. low), extraversion, agreeableness, conscientiousness, neuroticism, openness to experience, migration background, parent working in STEM, parents' SES. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency; BBSR – INKAR Database. 20 Imputations.

* $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Based on our results, we could reject Hypothesis 2 for girls: Contrary to the expectations, a higher share of women in STEM occupations was not associated with girls' STEM aspirations. However, in line with our expectations, a higher share of women in STEM

occupations tended to be negatively associated with boys' STEM aspirations, but this association was only marginally significant.

6.4.3 Contrasting Academic with Non-Academic STEM Aspirations

Figure 6.2 shows the predicted means of boys' and girls' non-academic (left) and academic (right) STEM aspirations by the share of STEM employees in the local labor market. The figure was based on the full model including all regional and individual controls (see Appendix, Table A6.2 for detailed results).

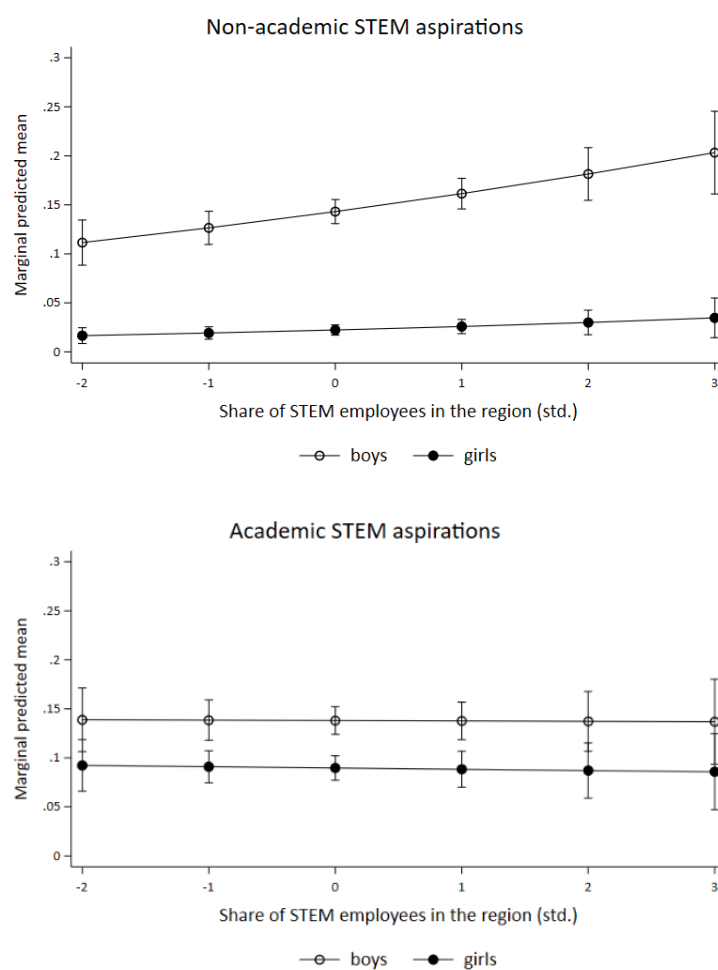


Figure 6.2. Comparison of Non-Academic and Academic STEM Aspirations and Their Association With the Share of STEM Employees for Boys and Girls.

Note. Regional and individual controls included. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency; BBSR – INKAR Database. 20 Imputations.

The positive association with STEM employees in the local labor market was only evident for boys with non-academic STEM aspirations (see Figure 6.2). In local labor markets with the highest share of STEM employees, boys were 11 percentage points more likely to

aspire to non-academic STEM careers than in local labor markets with the lowest share of STEM employees. This shows that the majority of the overall increase in the likelihood of boys having STEM aspirations is due to non-academic STEM aspirations.

Girls were much less likely than boys to aspire to non-academic STEM careers (see Figure 6.2). The association with the STEM prevalence in the local labor market was positive for girls as well, yet small and insignificant. Compared to non-academic STEM aspirations, girls were more likely to have academic STEM aspirations, although their likelihood remained at a lower level than for boys. Both boys and girls with academic aspirations remained at a lower level than for boys. Both boys and girls with academic aspirations were not significantly affected by the local STEM prevalence.

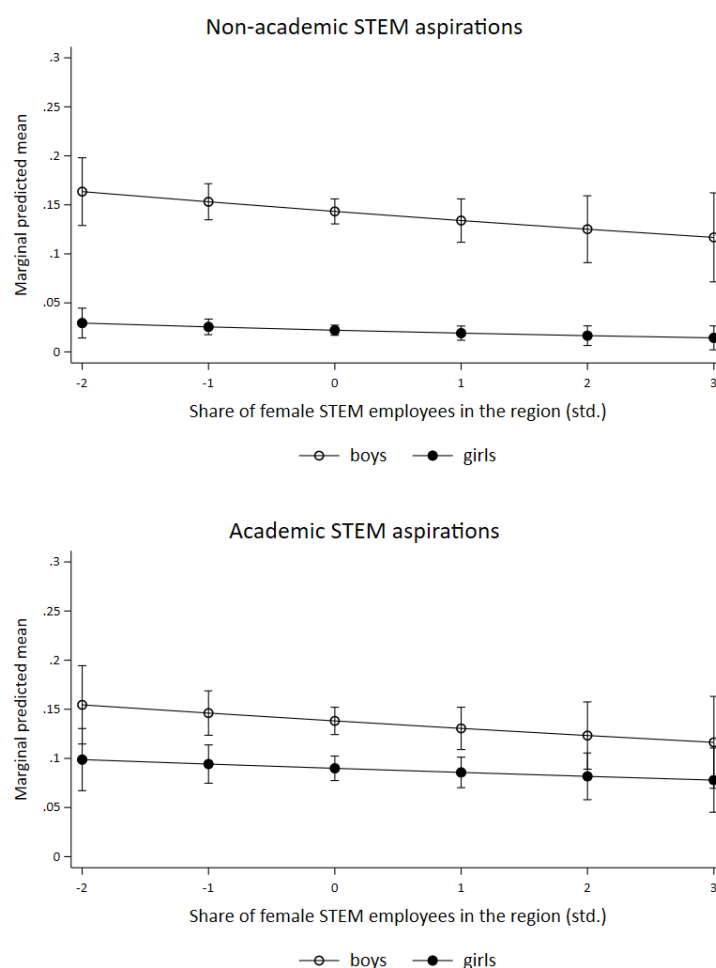


Figure 6.3. Comparison of Non-Academic and Academic STEM Aspirations and Their Association With the Share of Female STEM Employees for Boys and Girls.

Note. Regional and individual controls included. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency; BBSR – INKAR Database. 20 Imputations.

Figure 6.3 shows the associations with the share of female STEM employees in the local labor market, conditioning on regional and individual controls (see Appendix, Table A6.3 for detailed results). Both boys' and girls' non-academic and academic STEM aspirations were largely unaffected by the share of female STEM employees. While the associations tended to be negative, they were not statistically significant.

Thus, we found that boys with non-academic aspirations were affected by the share of STEM employees in the local labor market, while girls and boys with academic STEM aspirations were largely unaffected. These findings supported Hypothesis 3. In contrast, the share of female STEM employees did not significantly change either the non-academic or academic STEM aspirations of boys and girls.

6.4.4 Robustness Checks

A series of robustness checks was conducted to test the generalizability of our results. To examine differences between adolescents' idealistic and realistic aspirations, the main analyses were repeated for realistic STEM aspirations (see Appendix, Tables A6.6 and A6.7). Furthermore, we included both independent variables—the share of STEM employees and the share of female STEM employees—in a joint model predicting boys' non-academic STEM aspirations (see Appendix, Table A6.8, Model 1). This model was also run with additional controls for the following characteristics of local labor markets: the share of large firms, the share of filled apprenticeship positions, total gross value added, secondary sector gross value added, and the share of unskilled workers (see Appendix, Table A6.8, Models 2–6). Overall, the robustness checks produced similar results to the ones presented above.

We conducted additional heterogeneity analyses along three structural dimensions: East and West Germany, urban and rural contexts, and unemployment in the local labor market. The results suggested that the local STEM prevalence was more relevant to boys' non-academic STEM aspirations in East German labor markets and in local labor markets with high unemployment, whereas urbanity played a less decisive role (see Appendix, Figure A6.1).

6.5 Discussion

Contributing to the literature on the gender gap in STEM aspirations, this study examined whether the prevalence and gender composition of STEM occupations in the local labor market affect adolescents' STEM aspirations. Based on German panel data, we found that

the local STEM prevalence affects boys'—but not girls'—STEM aspirations, particularly for non-academic careers. The local gender composition of STEM workers, however, showed no clear associations with STEM aspirations of either boys or girls.

Local labor markets were not expected to outweigh other established influencing factors, such as familial socialization (Chesters, 2023; Hardie, 2015) or internalized personal interests (Ochsenfeld, 2016). Yet, our findings show that the local STEM prevalence exerts non-negligible influences on boys. Our results also indicate that such contextual influences are observable already in grade eight (aged 13-14), earlier in the educational trajectory than previously documented (Flohr et al., 2020; Hartung et al., 2022; Malin & Jacob, 2018).

That the local STEM prevalence matters only for boys' STEM aspirations highlights the role of stereotypical male occupational images of STEM that make boys much more likely than girls to consider STEM occupations as an acceptable career option (Thébaud & Charles, 2018). It is also consistent with prior research showing that boys align their aspirations more explicitly with contextual structures than girls (Hägglund & Leuze, 2021; Malin & Jacob, 2018; Palffy et al., 2023). Two different mechanisms may explain this: First, boys and girls may anticipate traditional work and family roles (Bass, 2015; Combet, 2024), although other studies suggested that work norms or family plans do not play a role in young people's study choices (Cech, 2016; Ochsenfeld, 2016). Second, male-dominated (STEM) occupations may be more location-dependent and less evenly distributed across local contexts than female-dominated occupations, such as care, clerical and trade occupations that are needed everywhere (Hausmann & Kleinert, 2014). This may increase the relevance of local labor market structures for boys.

By addressing Germany's stratified education system (Protsch & Solga, 2016), our results suggest that boys with non-academic STEM aspirations are most likely to be influenced by the local STEM prevalence. This supports previous research highlighting that non-academically oriented adolescents are more susceptible to local labor market conditions due to their limited mobility (Hartung et al., 2022; K. Morris, 2025). It is also consistent with the argument, recently refreshed by Chesters (2023), that boys from lower educational backgrounds have a more pronounced desire to pursue their careers in typically male occupations. Moreover, further analyses indicated that non-academically oriented boys living in East Germany and in high-unemployment areas were most influenced by the local STEM prevalence. In line with previous research (Hartung et al.,

2022), this suggests that adolescents in disadvantaged regions are more strongly oriented toward labor market conditions. While STEM occupations generally offer good career prospects and good pay (Anger et al., 2025; Fayer et al., 2017; Webber, 2014), such an orientation also carries the risk of reinforcing local dependencies on the labor market.

Contributing to the public debate on how to encourage girls to consider STEM careers as a viable option (European Commission, 2023), our study cannot provide support to the assumption that same-gender role models in the local labor market help to steer girls towards STEM. This is consistent with country-level research, where no effect of gender composition in STEM was found for girls either (Hägglund & Leuze, 2021). The low visibility of women in STEM occupations, who represent a minority of less than 30% compared to men across local contexts in Germany (Anger et al., 2021), may explain the absence of these effects.

Despite offering novel insights, our study is not without limitations. Spillover effects from neighboring regions were not testable, as not all German districts were represented in the NEPS survey data. Moreover, it was not possible to empirically identify the exact transmission channels with the available data. Future research could test different context sizes of regions to get a better idea of whether smaller local units, such as neighborhoods, or larger regional settings are more important in shaping adolescents' career aspirations. Investigating the prevalence of female-dominated occupations and their gendered impact on adolescents' career aspirations would also be informative to gain deeper insights into girls' orientation to local labor market structures.

6.6 Conclusions

It is widely known that boys' and girls' career aspirations reflect global cultural beliefs about gender and thus correspond to patterns of occupational gender segregation (Charles, 2017; Chesters, 2023). Our study has demonstrated that these beliefs are flavored by local contexts and their occupational structures. Local labor markets with a strong presence of STEM workers particularly influence the group of non-academically oriented boys by increasing their aspirations to pursue a career in STEM at an early age. This suggests that local labor market structures not only manifestly influence adolescents through the supply and demand for training places and jobs, but also reflect local occupational cultures and beliefs about career options. Given the relevance of career aspirations for career choices (Nießen et al., 2023; Schels et al., 2022; Weeden et al.,

2020), these findings have practical implications for vocational schools and training firms, which recruit apprentices predominantly from the local area (BIBB, 2022).

Local labor market structures appear to be particularly influential when the occupations that predominate are perceived as compatible with adolescents' gender. This mechanism may contribute to explain the persistence of occupational gender segregation in local labor markets with a high prevalence of STEM occupations. To counteract the segregating dynamics in these labor markets, it is important that measures—such as gender-sensitive career counseling, STEM engagement programs for girls, or a more female-focused advertising by employers—reflect the local labor market, are gender-specific, focus on non-academic adolescents, and take place early in the educational career. In this way, such policies can serve as a relevant instrument to address work-related gender inequalities and growing labor shortages. Based on the slightly increasing share of women in STEM in recent years (Anger et al., 2021; NCSES, 2023), it will be valuable to explore with newer data whether women in STEM may serve as a possible compensatory resource for reducing gender gaps in adolescents' STEM aspirations in the future.

7. Study 2: Partnerships as Signposts? The Role of Spatial Mobility in Gendered Earnings Benefits of Graduates

7.1 Introduction

The transition from higher education to work represents a formative life event in young adults' careers and is often accompanied by mobility decisions (Haußen & Übelmesser, 2015; Kley & Mulder, 2010). Decisions on spatial mobility offer young adults a variety of opportunities to shape their employment biography and manage their life course (Vidal & Lutz, 2018). Mobility readiness, i.e., the willingness to move, to commute, or even to telecommute, may facilitate the realization of higher earnings in the job as it can be regarded as an investment that provides access to a broader range of jobs (Sjaastad, 1970).

In the transition from higher education to work, gender inequalities in labor market outcomes are already apparent, as the literature has shown that even among similarly qualified higher education graduates, men achieve higher earnings than women (Combet & Oesch, 2019; García-Aracil, 2007; Triventi, 2013). Previous research has shown consistently across countries that the differences in earnings are to a large extent due to job characteristics, and that a significant unexplained difference remains, the extent of which depends on the country context (Triventi, 2013). Moreover, mobility is valued and used differently by men and women due to gender roles, indicating that coupled men use mobility decisions more often as a career strategy than women (Shauman & Noonan, 2007). For this reason, mobility decisions also have the potential to play a role in graduates' gender gap in earnings.

However, the gender-specific role of graduates' mobility has hardly been examined so far. Within the literature on mobility, one strand of research has focused on gender-specific benefits of mobility by looking at individuals who were already integrated into the labor force (e.g., R. Crane, 2007; Gutierrez, 2018; Kley & Drobnič, 2019; Le Barbanchon et al., 2020; McQuaid & Chen, 2012; Nafilyan, 2020; Nisic, 2009; Nisic & Abraham, 2015). Another strand of research has regarded higher education graduates' mobility. This research has shown that, overall, minor mobility benefits for graduates' earnings exist,

but has often not investigated gender-specific mechanisms (e.g., Jewell & Faggian, 2014; Kazakis & Faggian, 2017; Kidd et al., 2017; Venhorst & Cörvers, 2018). Therefore, it remains unclear whether and to what extent the benefits of mobility differ between male and female graduates. In this study, I address this research gap by investigating gender-specific benefits of mobility for graduate earnings.

Based on one of the central ideas of life course research, stating that individuals' lives and behaviors are embedded in a series of interdependencies with other people with whom they interact closely and maintain social relationships (e.g., Bernardi et al., 2019; Elder, 1994), it can be assumed that graduates base mobility decisions on other social actors, such as their cohabiting partners. Previous research has indicated that family and partners play an important role in individuals' mobility decisions (Cooke, 2008; Nisic & Abraham, 2015) and that gender inequalities are reinforced through unequal mobility benefits of married or coupled men and women (Black et al., 2014; Farré et al., 2023; Rapino & Cooke, 2011; Shauman & Noonan, 2007). However, there is a lack of research examining the role of partnerships in mobility benefits among graduates. Moving in with a partner is an important step in solidifying a romantic relationship, and research has stressed that the quality of the partnership is a crucial aspect of the intention to cohabit (Wagner et al., 2019). Therefore, this study contributes to previous research by comparing specifically the gender-specific mobility benefits of graduates who cohabit with a partner with those who do not.

Overall, this study focuses on three interrelated research questions: First, to what extent do higher education graduates benefit from mobility decisions for their first job in terms of higher earnings? Second, do graduates' mobility benefits differ by gender? Third, is cohabitation with a partner associated with increased differences in mobility benefits by gender, and is this also reflected in the impact of mobility on the gender gap in earnings depending on whether graduates cohabit with a partner? To provide adequate empirical answers to these questions, the study uses longitudinal data from the German National Educational Panel Study (NEPS-SC5) in combination with regional data from the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) at the level of districts (NUTS-3). The study defines graduates as spatially mobile if they have started a job in a region outside their study district, distinguishing the following three mobility types from graduates who stayed in their study region: home-comers (graduates returning to the region where they attended secondary school), short-distance movers

(mobility within a 90-minute car-driving radius), and long-distance movers (mobility beyond a 90-minute car-driving radius). Spatially mobile graduates can be expected to be systematically different from those who stay. Therefore, a strength of the study is the use of entropy balancing weights, which effectively balances out observable differences in the self-selection of graduates into different mobility patterns.

As a study context, Germany is particularly interesting for the investigation of gender-specific mobility benefits, as there are comparatively large gender differences in the earnings of higher education graduates (García-Aracil, 2007). A large part of these earnings differences is due to different fields of study, yet differences remain after taking fields of study and many other relevant characteristics into account (García-Aracil, 2007; Triventi, 2013). Moreover, there are large differences in local labor markets (e.g., Hartung et al., 2022), making mobility decisions a potentially relevant tool for graduates' careers. In Germany, access to higher education is comparatively highly regulated due to early tracking and sorting in the education system and the need for a university entrance qualification (Abitur) (Henninges et al., 2019). In addition, Germany has a comparatively strong system of vocational education and training that offers an attractive alternative to higher education. For these reasons, higher education graduates represent a highly selective group with respect to both school attainment and social background (Protsch & Solga, 2016). As in many other Western countries, marriage and family formation typically begin after graduation and entering the labor market, indicated by low shares of married students in higher education (Middendorf et al., 2013). However, cohabiting with a partner before marriage is very common, especially among individuals with high educational attainment (Wagner et al., 2019). According to Middendorf et al. (2013), 27% of all German students in higher education were cohabiting with a partner, with the share increasing with students' age and degree level. For this reason, Germany serves as an appropriate research context to examine graduates' cohabitation with a partner in relation to their gender-specific mobility benefits.

7.2 Background and Hypotheses

7.2.1 Graduates' Use and Benefits of Mobility

Following human capital theory, mobility decisions can be seen as an investment of which graduates usually expect certain returns (Sjaastad, 1970). Similar to educational decisions, individuals can be expected to compare the drawbacks of mobility (e.g., the search for

new housing) with their advantages (e.g., better career chances) and to make a cost-benefit calculation. Yet, the mobility of graduates entering the job market raises the important question of the degree to which those who become mobile are different from those who stay. The literature is well aware of this problem, which is known as self-selection (e.g., Jewell & Faggian, 2014; Kazakis & Faggian, 2017). As mobility is associated with higher (financial) costs, it can be assumed that graduates with more resources and higher human capital tend to be more open to mobility and become mobile more often. This would imply that graduates who become mobile are a positive selective group that would have achieved higher earnings even if they had not become mobile.

However, following the job competition theory (Thurow, 1975), mobility does not necessarily need to be rewarded with better jobs. The theory argues that every job requires a certain level of productivity and employees are listed up in a labor queue, with the best-suited candidates at the front. Therefore, graduates who are less qualified for the jobs might be forced to be mobile to find a suitable job elsewhere. In this scenario, mobile graduates would represent a negative selection of all graduates, who would be expected to obtain lower-paying jobs independent of their mobility decision (Venhorst & Cörvers, 2018).

The key question is whether graduates can also expect mobility benefits that go beyond self-selection processes. Apart from differences in qualifications, skills, and resources, mobile graduates are not limited to job opportunities at their place of study and are therefore likely to have a broader horizon in their job search (e.g., Kidd et al., 2017). Having a potentially higher number of suitable jobs should therefore increase graduates' chances of finding a more attractive and better-paying job. As graduates are assumed to make mobility decisions on a rational basis (Sjaastad, 1970), graduates who bear the costs of mobility can be expected to derive earnings benefits beyond mechanisms of self-selection, implying that mobility in itself brings advantages in earnings.

The existing research has pointed to several differences between mobile graduates and those who stay at their place of study, including human capital, the field of study, and regional characteristics (e.g., Carree & Kronenberg, 2014; Krabel & Flöther, 2014). Graduates' human capital, such as indicated by the study grade, was shown to be positively associated with the likelihood of becoming mobile in a study on German graduates (Krabel & Flöther, 2014). This suggests that mobile graduates are a positively

selected group of graduates that could be expected to gain higher earnings independently of their mobility decisions.

Graduates' fields of study may also be related to mobility decisions and mobility benefits. According to Faggian et al. (2007a), a science degree increased the likelihood of moving to a new location, while a humanities degree was associated with a higher likelihood of staying or returning to the place of origin. At the same time, gender differences in graduates' fields of study persist and are closely related to earnings differences (García-Aracil, 2007). Potential wages are higher for graduates in fields with high occupational specificity, including science and business occupations (Kopecny & Hillmert, 2021), and therefore the potential benefits of mobility may be more pronounced for graduates in these fields.

At the regional level, the self-selection of graduates into urban regions with better labor market opportunities is particularly relevant, as research has shown that employees, and women in particular, benefit from comparatively higher earnings in these regions (Hirsch et al., 2013; Krabel & Flöther, 2014; Nisic, 2017). Research has also shown that a significant proportion of the wage differences between graduates can be explained by regional labor market conditions (Kopecny & Hillmert, 2021). Therefore, graduates can be expected to benefit from moving especially if their study region has rather few labor market opportunities (e.g., regions with low demand for tertiary educated workers and low income levels).

Overall, previous research has shown that mobile graduates tend to achieve higher earnings (French et al., 2020; Jewell & Faggian, 2014; Kazakis & Faggian, 2017; Kidd et al., 2017; Venhorst & Cörvers, 2018). However, a closer look at the literature reveals a more complex picture, resulting from different data and methodological approaches as well as mobility measurements. Among other things, studies varied in how they accounted for selection mechanisms of mobile graduates. The British study by Jewell and Faggian (2014) found positive earnings benefits from mobility after applying propensity score matching. The estimated earnings benefits tended to be even larger than in ordinary OLS, which suggests that mobile graduates represented rather a negative than a positive selective group in this study. By using quantile regression models and relying on control variables on self-selection of mobile graduates, the British study by Kidd et al. (2017) also showed positive mobility benefits on earnings. By focusing on commuting times, US study results

from French et al. (2020) also indicated positive mobility benefits for young adults, relying on control variables for self-selection.

These findings on mobility benefits contrast with other empirical studies that found evidence for positive selection effects (Kazakis & Faggian, 2017; Venhorst & Cörvers, 2018). By using an instrumental variable approach, the Dutch study by Venhorst and Cörvers (2018) suggested that controlling for self-selection fully explained the positive mobility benefits on earnings. Similarly, US study results from Kazakis and Faggian (2017) showed large differences in the results on mobility benefits between general linear models and multinomial treatment models that accounted for self-selection. Their robustness checks revealed, however, that restricting the sample to younger age groups up to 40 years yielded significant mobility benefits while still accounting for self-selection (Kazakis & Faggian, 2017).

Previous research has further argued to differentiate distinct types of mobility to account for differences in the group of mobile graduates, such as graduates who return to their home region as opposed to graduates who (repeatedly) move to new regions (Jewell & Faggian, 2014; Kazakis & Faggian, 2017; Kidd et al., 2017). While graduates who return home after graduation achieved lower earnings than graduates staying at the place of study, moving to a new region has been associated with higher earnings than staying in two studies from the UK (Jewell & Faggian, 2014; Kidd et al., 2017). These findings are challenged by results from Kazakis and Faggian (2017), who found only positive mobility benefits for doctoral degree holders who repeatedly moved, but not in their whole sample of graduates. However, in the age-restricted sample, positive mobility benefits were also found for the entire group of graduates who moved to a new region (Kazakis & Faggian, 2017).

All in all, human capital theory provides plausible reasons to expect that graduates extend their job search horizon by considering becoming mobile. Therefore, when graduates decide to enter the labor market in a new region that is outside of their place of study and their home region, they can be expected to have chosen their job out of a broader range of job opportunities and are more likely to receive benefits, such as better paid work. These benefits are expected to go beyond mechanisms of self-selection. In line with these theoretical expectations, most empirical studies indicate that certain types of mobility, such as moving to a new region after graduation, are associated with higher earnings. I assume:

H1: Graduates who begin their first job in a new region receive higher earnings than graduates who stay in their study region.

7.2.2 Gendered Perspectives on Graduates' Mobility

The literature on gender differences in the use and benefits of mobility has often argued that mobility decisions contribute to the existing labor market inequalities between men and women (R. Crane, 2007; Kley & Drobnič, 2019; McQuaid & Chen, 2012; Nisic, 2009; Nisic & Abraham, 2015; Rapino & Cooke, 2011; Shauman & Noonan, 2007). This research has focused mainly on individuals who are already in the labor force as well as on couples or married individuals. A common explanation refers to salient gender role behaviors of men and women, which affect how mobility is valued and used (e.g., Rapino & Cooke, 2011; Shauman & Noonan, 2007). Following the stereotypical image of the male breadwinner, men's behavior is typically more career-oriented than women's. As men are socialized to give more weight to their career benefits, male graduates could be expected to use mobility in a more career-strategic way than females. This may be both expressed in men accepting higher mobility costs for career returns and in having higher competence in negotiations with employers in new environments (Comunian et al., 2017; Kulik & Olekalns, 2012). As a result, men may achieve higher earnings benefits than women when starting a job in a new region.

However, there are reasons to assume rather gender-equal mobility benefits among graduates: First, young graduates can be expected to make mobility decisions more independently from societal roles than individuals who are already in the workforce and often need to consider more complex consequences for their families and therefore often have to compromise (e.g., Nisic & Abraham, 2015; Plyushteva & Schwanen, 2018). Second, as views on gender roles often change over the life course, for example with the onset of parenthood (Katz-Wise et al., 2010), personal views of recent graduates on gender roles are likely to be less traditional than those held by the rest of the working population. For these reasons, female graduates can be expected to use mobility in similar career-strategic ways as their male counterparts and it appears less clear whether gender differences in the benefits of mobility already exist among graduates.

Studies on spatial mobility of higher education graduates have mostly not included gender-specific analyses. Previous research from the UK even suggested that female graduates are more mobile than male graduates for their first employment (Faggian et

al., 2007b). This result stands in contrast to research on commuting behaviors of coupled men and women which has indicated that women are less willing to commute and accept lower wages in return (Gutierrez, 2018; Le Barbanchon et al., 2020; McQuaid & Chen, 2012; Nafilyan, 2020). However, as Faggian et al. (2007b) pointed out, young graduates can be expected to be less dependent on partner decisions.

Research on gender-specific mobility benefits of graduates is relatively scarce and provides mixed evidence: Comunian et al. (2017) showed that wage benefits from moving repeatedly are significantly lower for female graduates compared to male graduates. For other types of mobility, such as graduates who moved only before or after graduation, no gender differences were evident (Comunian et al., 2017). Venhorst and Cörvers (2018) showed also that mobility benefits are more pronounced for men, however, gender differences disappeared after controlling for self-selection of mobile graduates. By looking at commuting times, French et al. (2020) found that mobility benefits are similarly evident for male and female graduates.

Furthermore, gender differences in fields of study and human capital may lead to heterogeneous mobility decisions and benefits. For example, if job opportunities in typically male occupations (e.g., STEM occupations) are more dependent on large firms that are unevenly distributed across regions (Anger et al., 2021), mobility may often be necessary in these cases to access better jobs and thus be particularly beneficial for male graduates due to gender-specific fields of study. Conversely, graduates with higher human capital might be expected to use mobility more career-strategically, accepting higher costs to invest their human capital (Faggian et al., 2007a), possibly favoring female graduates who, on average, have slightly higher grades than male graduates (e.g., Conger & Long, 2010). Therefore, if one is interested in identifying gender-specific mobility benefits, it is important to control for gender differences in human capital and field of study that may affect graduates' mobility decisions. Nevertheless, heterogeneous mobility benefits – which are not the main focus of this study – may remain and affect the generalizability of the results, which is why they are a relevant issue for robustness checks.

As graduates represent a young and academically oriented group of individuals, there are good reasons to assume that women use mobility in similar ways as men. Falkingham et al. (2016) demonstrated that young women's use of mobility has significantly increased in light of wide-ranging changes in the role of women in society throughout the 20th century. These changes may also have contributed to more and more equal mobility

benefits for male and female graduates. Overall, no clear gender differences in graduates' mobility benefits are expected, unless further information on partner dependencies is taken into account. Therefore, I see theoretical support for the following scenario:

H2: The benefits of mobility after graduation are similar for male and female graduates.

7.2.3 The Role of Partner Dependencies

In a complex world of interdependencies, mobility decisions are often not made alone but involve other social actors such as family or partner⁵ (Nisic & Abraham, 2015). For this reason, it is reasonable to assume that graduates' mobility decisions and their benefits vary depending on their household context. Having a partner who is affected by mobility decisions often requires compromises (A. E. Green, 1997).

Following the classical theory of household economics, households become mobile if the sum of all individual benefits is greater than the sum of costs (Mincer, 1978). Although this approach may seem somewhat simplistic in the context of today's diverse types of relationships (e.g., long-distance relationships, weekend relationships), relevant arguments can be derived from it. Importantly, the theory suggests that benefits do not need to be higher for every household member, and indeed this appears to rarely be the case. Due to often higher income prospects of male partners, the theory can explain that men are more likely to dominate mobility decisions over women in partnerships. This can lead to women deriving little or no benefits from mobility in favor of their partners' benefits, settling women into the role of "tied movers" (Mincer, 1978).

The argument of the marital power theory points in a very similar direction, assuming that power is not equally distributed between partners and mobility decisions and their benefits are dominated by the partner who has higher valued resources (Rodman, 1972; Smits et al., 2003). Following this argument, the distribution of power depends on which partner has the higher income, is better educated, or has the better-valued job. For this reason, it is not necessarily men who dominate mobility decisions, although they are still expected to do so more often.

⁵ In the following, the theoretical arguments focus exclusively on heterosexual partnerships. Although Western societies have changed considerably in recent years, heterosexual partnerships remain by far the most common form of romantic relationship and therefore provide the most feasible empirical basis for this study.

A slightly different angle is provided by gender role theories (e.g., Lindsey, 2020; Ridgeway, 2009), after which men are socialized to fulfill the role of the male breadwinner, for which they place higher value on their careers. Women's mobility benefits on the other hand might be less relevant in the presence of a career-oriented partner. Following the logic of gender roles, men dominate mobility decisions even if both partners have similar human capital or the woman's human capital exceeds that of the man. Along with what is known about how gender role attitudes tend to become more traditional in partnerships over time (Grunow et al., 2012; Katz-Wise et al., 2010), it can be expected that also among graduates gender role behaviors are more pronounced if they live in a steady relationship during their studies. In line with this argument, recent research has shown that romantic relationships prevent young people from developing more egalitarian gender roles, especially for women (Wilhelm et al., 2023).

The theories of household economics (Mincer, 1978), marital power (e.g., Rodman, 1972; Smits et al., 2003), and gender roles in partnerships (e.g., Lindsey, 2020; Ridgeway, 2009) predict that men will often dominate mobility decisions over their cohabiting female partners. The key point is that mobility decisions are generally expected to provide opportunities for better paid jobs, but if the decision of when and where to move is dominated by the male partner, the female partner is restricted in her job search opportunities and may not automatically find a suitable, better paying position in the new location. This is expected to lead to greater gender differences in earnings among cohabiting couples when they become spatially mobile.

To assess the role of partner dependencies it is important to compare coupled men and women with singles. Only a few studies are making this comparison in the context of mobility decisions. The German study by Abraham et al. (2019) and the French study by Le Barbanchon et al. (2020) showed that the willingness to move or commute is lower among couples than singles. Furthermore, Abraham et al. (2019) as well as the US study by Rapino and Cooke (2011) showed that the willingness to move was significantly lower among coupled women than among coupled men, while no gender differences were found among single and unmarried people. However, it remains unclear if a lower willingness to become mobile is also linked to lower mobility benefits.

Without focusing on graduates and singles, the majority of research has shown overwhelming differences in mobility benefits between coupled men and women. US studies by Black et al. (2014) and Farré et al. (2023) indicated that living in cities with

longer commuting times stopped coupled women more than coupled men from participating in the workforce. By focusing on the earnings benefits of mobility, Shauman and Noonan (2007) showed that mobility was associated with decreased earnings for coupled women, but with higher earnings for coupled men in the US. The study empirically underlined gender role explanations over other human capital-based or structural explanations, indicating that couples' mobility decisions primarily serve to promote men's careers. Similarly, a Dutch study by Smits (2001) showed that married women have lower earnings from mobility in favor of their partners' careers.

Overall, there is a lack of research focusing on the gendered benefits of graduate mobility as a function of partnership situations. However, it can be expected that graduates who cohabit with their partner are affected in their mobility benefits by joint decisions on household economics and internalized gender-stereotypical roles in the partnership. I assume that women have higher mobility benefits if their mobility decisions are made in the absence of a cohabiting partner. Without a cohabiting partner, women can make mobility decisions independent of gender-specific compromises as tied movers, and gender roles in partnerships cannot slow them down in their career entry. The opposite can be assumed for males: Male graduates who cohabit with their partner might feel strengthened in their career orientation by salient gender roles and benefit from household economic considerations. Therefore, it can be assumed that male graduates are more career-oriented and have greater mobility benefits in the case of a stable relationship. This results in the assumption that gender differences in mobility benefits are more pronounced when graduates cohabit with their partner, whereas gender differences in mobility benefits may be smaller when graduates live alone.

H3: Mobility benefits are higher for male graduates and lower for female graduates if they cohabit with a partner than if they live alone, which is reflected in larger gender differences in earnings.

7.3 Methods

7.3.1 Data

This study used data from the German National Educational Panel Study (NEPS), Starting Cohort First-Year Students (SC5) (Blossfeld & Roßbach, 2019; NEPS Network, 2022), which contain rich information on pathways through higher education and transitions into working life. The data collection began in 2010 with 17,909 representatively selected first-

year students enrolled at German universities and has been repeated annually since then. In total, the data include information on individuals between 2010 and 2020.

In order to study the benefits of graduate mobility, the target group is young graduates who have been able to choose between different types of mobility and who have successfully entered the labor market. Therefore, certain selection criteria were applied to ensure the comparability of graduates' mobility decisions with regard to their first job. First, individuals who were still attending secondary school at the beginning of the data collection in 2010 or who graduated from a secondary school outside Germany were excluded. Second, graduates had to be under the age of 25 when they began their higher education to ensure comparability of graduates' living situations. Third, graduates had to be enrolled in higher education for at least three years, which is equivalent to the standard time for a bachelor's degree, and their institution- and subject-specific higher education cluster had to be identifiable. Fourth, graduates had to start regular, dependent employment that is not seasonal work, a student assistant job, or part of the secondary labor market. Consequently, graduates with missing employment information (e.g., due to panel attrition) were lost to the sample. To ensure data plausibility, the employment also had to consist of more than 10 contracted working hours per week and earnings had to be above €450 per month. Fifth, the employment had to begin no more than three months before the official graduation date, or within the first two years after graduation, and had to last for more than three months. Sixth, the small group of graduates in same-sex partnerships (around 1% of the sample) was excluded from the analysis. Finally, graduates had to provide valid information on the places of secondary schooling, study, and employment, so that mobility patterns could be observed. Students who left the higher education system after at least three years but did not have information on a successful completion were not excluded, as this would further reduce the representativeness of the sample, although strictly speaking this group of people (about 4% of the sample) cannot be considered graduates. Instead, the missing degree information was taken into account in the form of a control variable. By applying the above criteria, the study ended up with a sample of 4,670 graduates who were between the ages of 20 and 33 (*mean* = 26.20) when they left the higher education system. A comprehensive overview of the sample selection and reduction can be found in the Appendix, Table A7.1.

To avoid further reductions in sample size, multiple imputation methods were applied for missing data in the analytical sample. I estimated $M = 20$ plausible values for all missing values based on the set of covariates used for the main analysis. For this procedure, van Buuren and Groothuis-Oudshoorn's (2000) algorithm on multivariate imputations by chained equations was used. An overview of the number of complete and imputed cases can be found in the Appendix (see Table A7.2). The NEPS data were combined with regional data at the level of districts (NUTS-3) from the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) to include information on regional characteristics of the study locations as well as on distances of mobility.

7.3.2 Variables

The outcome variable of interest is earnings in the first steady job after graduating from higher education which was measured in line with previous research by *hourly wages* (e.g., Venhorst & Cörvers, 2018). This study used information on graduates' self-reported monthly gross income divided by the number of contractually agreed weekly working hours. The number of contracted working hours was capped at a value of 60 in accordance with the German legislation. In addition to hourly wages, the study also used monthly wages in the form of the unadjusted self-reported monthly gross income as an alternative outcome to test the robustness of the results. Table 7.1 gives an overview of the wage distribution and all other variables for male and female graduates.

Mobility after graduation represents the treatment variable which contains NUTS-3 district-level information on the most recent living place during higher education, the place of employment, and the place of secondary schooling. Additionally, the study accounts for distances by considering car-traveling times between the main municipalities of the districts. Graduates employed in the same district as the place of living during studies were categorized as "stayers", representing the reference group. To take the heterogeneity of mobile graduates into account, three other types of mobility were distinguished when graduates' employment was not located at their place of residence during higher education: "home-comers", "short-distance movers" and "long-distance movers". I identified mobile graduates as home-comers if the district of employment was the same as or within a 30-minute car-driving radius of the district of their previous secondary school. Short-distance movers were classified if the district of employment was a different place within a 90-minute car-driving radius from the study district, long-distance movers if the employment was in a new place beyond the radius of 90 minutes.

To estimate the moderating role of *partner dependencies*, respondents were asked if they cohabit with a partner or spouse in the same household. Given the relatively young age of higher education graduates, not all partnerships are of similar scope and importance for individuals' mobility decisions. To account for the degree of institutionalization of a partnership, this study focused on partners who were already cohabiting during studies and stayed together after graduation. In this way, short-term relationships that can be expected to be less relevant for mobility decisions were disregarded. As information on cohabitation with a partner was collected annually, it was used for the year of graduation or, if not available, for the most recent year before.

The study further used a set of covariates to account for confounding biases due to self-selection processes. It is theoretically plausible that graduates' individual characteristics such as status expectations, academic skills, personality, field of study, age at graduation, study degree, children living in the household, migration background, and parents' socioeconomic status can affect their mobility decisions and may also influence the earnings in the first job (for illustration, see Appendix, Figure A7.1). *Status expectations* were measured by considering students' realistic occupational aspirations before graduation, coded with the international socio-economic index of occupational status (ISEI) (Ganzeboom, 2010). *Academic skills* were operationalized by graduates' final grades, which were recoded so that high values mean high academic skills. *Personality* was operationalized based on the Big Five inventory, using standardized measurement scores on extraversion, agreeableness, conscientiousness, neuroticism, and openness. The *field of study* was separated into arts and humanities (reference category), economics, sciences, and teaching. *Age at graduation* was included as a metric variable indicating the age at the end of the last higher education episode. The *study degree* was measured as a categorical variable that records whether the students left the higher education system with a Master's degree or equivalent, a Bachelor's degree or equivalent, or no degree. *Children in the household* was considered as a binary variable indicating whether graduates had children living in the same household during their studies.

Migration background was considered as a binary variable indicating if graduates and their parents were born in Germany or not. *Parents' socioeconomic status* was measured by considering the highest ISEI of the parents (Ganzeboom, 2010). Finally, a binary variable was included on whether survey participants were part of the regular sample composition or the *teacher oversampling* group.

Table 7.1. Descriptive Statistics on Unweighted Sample Distributions.

	Women (N = 2,857)				Men (N = 1,813)			
	Mean	SD	Min	Max	Mean	SD	Min	Max
<i>Earnings:</i>								
Hourly wages (Euro)	22.28	9.43	2.08	81.73	24.21	9.15	2.80	81.83
Ln(hourly wages)	3.02	0.43	0.73	4.40	3.11	0.40	1.03	4.40
Monthly wages (Euro)	3104.49	1305.23	451.00	10140.0	3717.87	1438.39	459.55	11800.0
Ln(monthly wages)	7.94	0.48	6.11	9.22	8.13	0.46	6.13	9.38
<i>Mobility for the first job:</i>								
Stayers (ref.)	0.36	0.48	0.00	1.00	0.36	0.48	0.00	1.00
Home-comers	0.17	0.37	0.00	1.00	0.17	0.37	0.00	1.00
Short-distance mobility	0.25	0.44	0.00	1.00	0.24	0.43	0.00	1.00
Long-distance mobility	0.22	0.41	0.00	1.00	0.23	0.42	0.00	1.00
<i>Individual controls:</i>								
Status expectations (std.)	0.02	0.98	-5.39	1.19	-0.03	1.03	-5.38	1.19
Final grade	0.01	0.99	-4.36	1.73	-0.01	1.02	-4.36	2.07
<i>Field of study:</i>								
Arts and humanities (ref.)	0.23	0.42	0.00	1.00	0.08	0.27	0.00	1.00
Economics	0.15	0.36	0.00	1.00	0.21	0.41	0.00	1.00
Sciences	0.25	0.43	0.00	1.00	0.54	0.50	0.00	1.00
Teaching	0.37	0.48	0.00	1.00	0.17	0.38	0.00	1.00
<i>Personality:</i>								
Extraversion (std.)	0.06	0.99	-3.29	1.56	-0.10	1.01	-3.29	1.56
Agreeableness (std.)	0.15	0.97	-4.18	2.56	-0.24	1.00	-4.69	2.56
Conscientiousness (std.)	0.20	0.94	-3.17	1.58	-0.31	1.01	-3.17	1.58
Neuroticism (std.)	0.24	0.98	-2.14	2.82	-0.38	0.92	-2.14	2.29
Openness to experience (std.)	0.15	0.97	-2.82	1.61	-0.23	1.00	-2.82	1.61
Age at graduation (std.)	-0.17	0.98	-3.24	3.63	0.28	0.98	-2.62	4.20
<i>Study degree:</i>								
No degree (ref.)	0.04	0.19	0.00	1.00	0.05	0.21	0.00	1.00
BA or equivalent	0.47	0.50	0.00	1.00	0.34	0.47	0.00	1.00
MA or equivalent	0.49	0.50	0.00	1.00	0.62	0.49	0.00	1.00
Cohabiting with a partner	0.44	0.50	0.00	1.00	0.38	0.48	0.00	1.00
Children in the household	0.03	0.18	0.00	1.00	0.04	0.20	0.00	1.00
Migration background (ref. no migration background)	0.10	0.31	0.00	1.00	0.13	0.33	0.00	1.00
Parents' socioeconomic background (std.)	-0.03	1.01	-2.51	1.45	0.04	0.99	-2.42	1.45
Teacher oversampling (ref.: not part of the oversampling)	0.18	0.38	0.00	1.00	0.09	0.29	0.00	1.00
<i>Regional controls:</i>								
Size of service sector in the study region (std.)	-0.01	1.00	-1.99	2.75	0.01	1.00	-1.91	2.75
Median income level of the study region (std.)	-0.02	1.00	-2.57	3.04	0.03	1.01	-2.57	3.04
Population size in the study region (std.)	-0.01	0.99	-0.68	3.48	0.01	1.01	-0.68	3.48

Note. Data source: NEPS-SC5 17-0-0; BBSR — INKAR Database. 20 Imputations.

Moreover, potential confounders at the regional level were considered, which may arise because graduates' mobility patterns and benefits exist not independently of characteristics of their study regions. The regional *income level* was measured by the median income reflecting regional wage structures. Regional labor market prospects for higher education graduates were proxied by the share of *service sector occupations*. Regional *population size* was used to account for major differences between rural and urban areas as well as the district size.

7.3.3 Analytical Strategy

As previously mentioned, a major issue in estimating mobility effects is that graduates who decide to become mobile are different in many ways from non-mobile graduates. To account for this self-selection, the study applied entropy balancing (Hainmueller, 2012). Entropy balancing is an iterative method that balances observable differences in the treatment and control groups and is frequently used in recent research (e.g., Combet & Oesch, 2019; Traini et al., 2021; Witte et al., 2023). Compared to common matching procedures such as propensity score models, entropy balancing uses all cases of the distribution and provides a higher efficiency (Hainmueller, 2012). Notable differences between the unbalanced mobility groups could be observed for all variables indicating self-selection into mobility, although to varying degrees (see Appendix, Tables A7.3 and A7.4). Larger differences were observed for the share of graduates living with a partner, which was lower for male and female graduates who stayed at the place of study, and between fields of study (e.g., economics students became more often mobile over longer distances, teaching students returned more often to the place of secondary schooling). For the balancing, I used all individual variables except the outcome variable. The use of entropy balancing weights in the analyses ensured that not only the means, but also the variances and skewnesses of the set of variables were almost equal across all four mobility groups. To avoid issues of serial correlations of graduates within the same degree programs, university- and major-specific cluster IDs were considered in the entropy balancing procedure as the primary sampling unit.

I calculated general linear models predicting graduates' hourly wages. Depending on the form of representation, the raw hourly wage and its natural logarithm were used to facilitate interpretation. To generally assess graduates' mobility benefits (Hypothesis 1), combined models were estimated for male and female graduates. In the first step, I used only mobility as a predictor to observe mobility benefits at a bivariate level. In the second

step, I accounted for graduates' self-selection by applying entropy balancing weights and including control variables. In doing so, I followed the current research standard as this procedure has been shown to contribute to more precise coefficient estimates (e.g., Oster, 2019).

To account for gender-specific mechanisms that were formulated in Hypotheses 2 and 3, separate models were calculated for male and female graduates. To test Hypothesis 2, bivariate associations between mobility and hourly wages were estimated in the first step, followed by the inclusion of control variables and entropy balancing weights in the second step. In the third step, an interaction term between partnership information and mobility was added to test gender-specific mobility benefits by cohabiting partnerships (Hypothesis 3). For reasons of transparency and to check robustness, the gender-specific analyses were repeated without the use of entropy balancing weights (see Appendix, Table A5).

To further assess the impact of graduates' mobility decisions on gender differences in earnings by partnership (Hypothesis 3), I computed general linear models separately for graduates living alone and for graduates cohabiting with a partner, with an interaction term between gender and mobility, using entropy balancing weights and including controls. To illustrate the differential effects, marginal predicted means were estimated based on the results of the general linear models.

The imputation model and the entropy balancing were performed using the software R (version 4.2.1). For all further analysis, Stata 17 was used.

7.4 Results

7.4.1 Overall Benefits of Mobility

The results show that graduates received mobility benefits: Graduates who became mobile over shorter distances received on average 5% higher earnings in their first job ($b = .05$; $p < .01$) (see Table 7.2 and Appendix, Table A7.6). These benefits could not be explained by positive selection of graduates who became mobile, as suggested by model 2, in which entropy balancing weights and control variables were added ($b = .05$; $p < .01$). For long-distance mobility, the results were similar, with an average of 4% higher earnings, which was robust to graduates' self-selection ($b = .04$; $p < .05$). Home-comers obtained on average similar earnings as graduates staying at the place of study. These

results supported the assumption of the first hypothesis that graduates receive higher earnings if they move to a new region that is outside their study place and home region.

Table 7.2. Regression of Log. Hourly Wages on Mobility After Graduation.

	All Graduates			
	Model 1		Model 2	
<i>Mobility for the first job (ref. staying at the place of study):</i>				
Home-comers	0.01	[0.02]	0.01	[0.02]
Short-distance mobility	0.05**	[0.02]	0.05**	[0.02]
Long-distance mobility	0.04*	[0.02]	0.04*	[0.02]
<i>Entropy balancing weights</i>				✓
<i>Control variables</i>				✓
<i>N</i>	4,670		4,670	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7.4.2 Mobility Benefits for Male and Female Graduates

On average, male graduates had higher hourly and monthly wages in their first job than female graduates, but used mobility for their first job in similar proportions (see Table 7.1). Nevertheless, mobility might affect earnings differently for men and women. To test gender-specific mechanisms in mobility benefits, results are shown separately for female graduates (see Table 7.3 and Appendix, Table A7.7) and male graduates (see Table 7.4 and Appendix, Table A7.8).

For female graduates, short-distance mobility was positively associated with higher earnings at a bivariate level (see Table 7.3, model 1). Female graduates who started their first employment at a new place within a short distance received on average 7% higher hourly wages compared to female stayers ($b = .07$; $p < .001$). This association was largely robust to self-selection of female mobile graduates that was accounted for in model 2 ($b = .06$; $p < .01$). Other types of mobility were not associated with higher earnings among female graduates.

Table 7.3. Regression of Log. Hourly Wages on Women's Mobility After Graduation.

	Women					
	Model 1		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>						
Home-comers	0.01	[0.02]	0.00	[0.02]	0.01	[0.03]
Short-distance mobility	0.07***	[0.02]	0.06**	[0.02]	0.12***	[0.03]
Long-distance mobility	0.03	[0.02]	0.02	[0.02]	0.04	[0.03]
<i>Partnerships (ref. living alone):</i>						
Cohabiting with a partner			0.00	[0.02]	0.05	[0.03]
<i>Interaction between mobility and cohabiting with a partner:</i>						
Home-comers # Cohabiting with a partner					-0.01	[0.05]
Short-distance mobility # Cohabiting with a partner					-0.12**	[0.04]
Long-distance mobility # Cohabiting with a partner					-0.05	[0.05]
<i>Entropy balancing weights</i>			✓		✓	
<i>Control variables</i>			✓		✓	
<i>N</i>	2,857		2,857		2,857	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7.4. Regression of Log. Hourly Wages on Men's Mobility After Graduation.

	Men					
	Model 1		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>						
Home-comers	0.02	[0.03]	0.02	[0.03]	0.01	[0.04]
Short-distance mobility	0.02	[0.03]	0.03	[0.03]	0.03	[0.04]
Long-distance mobility	0.05 ⁺	[0.03]	0.06 [*]	[0.03]	0.00	[0.03]
<i>Partnerships (ref. living alone):</i>						
Cohabiting with a partner			0.00	[0.02]	-0.03	[0.03]
<i>Interaction between mobility and cohabiting with a partner:</i>						
Home-comers # Cohabiting with a partner					0.03	[0.06]
Short-distance mobility # Cohabiting with a partner					-0.01	[0.05]
Long-distance mobility # Cohabiting with a partner					0.14 ^{**}	[0.06]
<i>Entropy balancing weights</i>			✓		✓	
<i>Control variables</i>			✓		✓	
<i>N</i>	1,813		1,813		1,813	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

For male graduates, a slight benefit of long-distance mobility was observed at the bivariate level in the form of a 5% increase in earnings, as shown in Table 7.4, model 1 ($b = .05$; $p < .10$). While this association was only significant at the 90% confidence level, mobility benefits were more apparent after controlling for self-selection in model 2 ($b = .06$; $p < .05$). This indicates that there was some negative selection into long-distance mobility of male graduates. Robustness checks revealed that male graduates who studied in a more advantageous study region (i.e., with a high median income level) were less likely to become mobile over longer distances and earned relatively higher hourly wages, resulting in significantly lower mobility benefits (see Appendix, Table A7.18). Accounting for differences in study regions can therefore contribute to identifying graduates' mobility benefits.

The results indicate that gender differences in mobility benefits could be observed with respect to the type of mobility (short- or long-distance). However, in line with the second hypothesis, the combined mobility benefits of moving to a new region were rather similar for male and female graduates.

7.4.3 The Moderating Role of Partnerships

Including partnership information and their interaction with mobility leads to a more differentiated picture. Female graduates who did not cohabit with a partner benefited from short-distance mobility by receiving 12% higher hourly wages ($b = .12$; $p < .001$) (see Table 7.3, model 3). At the same time, no significant earnings differences could be observed for female stayers when cohabiting with their partner. Moreover, the positive benefits of short-distance mobility did not apply to female graduates who cohabited with their partner, as indicated by the negative interaction ($b = -.12$; $p < .01$). Similar tendencies could be observed for interactions with long-distance mobility, however, the associations were not statistically significant.

For male graduates, cohabiting with their partner was not associated with higher wages, unless male graduates became mobile, as indicated by the results in Table 7.4, model 3: Long-distance mobility paid off for male cohabiting graduates, leading to higher wages of about 14% ($b = .14$; $p < .01$). Short-distance mobility and mobility back to the home region did not affect male graduates' hourly wages, regardless of whether they had a cohabiting partner. Male graduates who did not cohabit with a partner had no evident mobility benefits, not even from long-distance mobility.

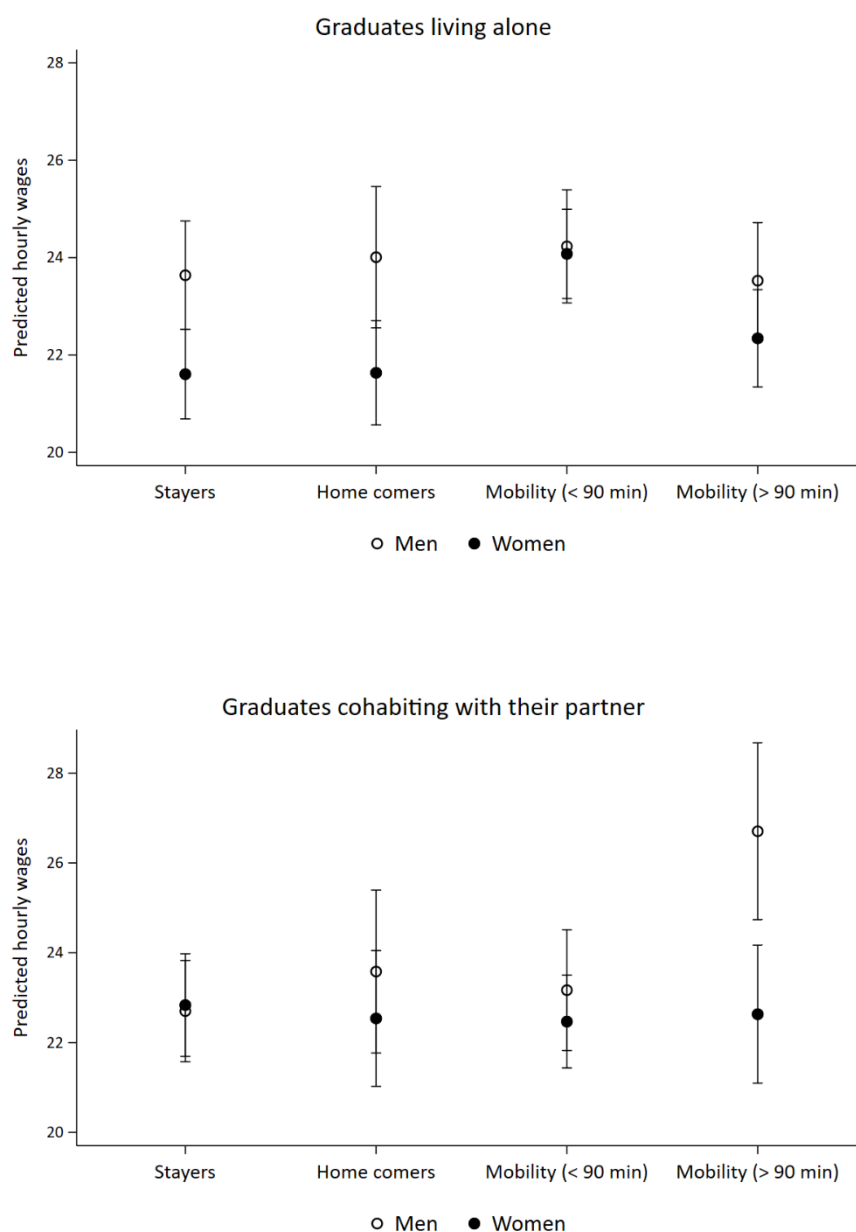


Figure 7.1. Predicted Hourly Wages by Mobility and Gender for Graduates Living Alone and Graduates Cohabiting With Their Partner.

Note. Entropy balancing weights and control variables included. Models were calculated separately for graduates living alone and cohabiting graduates. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 imputations.

To get a better understanding of the earnings differences, Figure 7.1 shows the gender-specific mobility effects on the predicted hourly wages separately calculated for graduates living alone (upper part) and cohabiting with their partner (lower part). As illustrated, the size of the gender gap in earnings varied considerably: For graduates living alone and staying at their place of study, the predicted gender gap in hourly wages was around €2.03. In line with the previous results, hourly wages of male graduates living alone were not much affected by their mobility, whereas for female graduates especially short-distance mobility paid off. This resulted in a strongly reduced gender gap (€0.15). A similar but less pronounced pattern could be observed for graduates living alone who were mobile over longer distances, where the predicted gender gap was reduced to €1.19.

For cohabiting graduates, one could observe a very different picture (see Figure 7.1, lower part): whereas the gender earnings gap was not evident for stayers (€-0.13), the gap was clearly in favor of male graduates and significantly larger when partnered graduates became mobile, especially over longer distances. In particular, gender gaps for graduates' long-distance mobility rose to a predicted level of about €4.07 due to high mobility benefits for men but not for women.

Taken together, the results demonstrated that mobility benefits on earnings existed, but were rather small in general. Female graduates benefited from short-distance mobility, whereas for men long-distance mobility tended to be more lucrative. Partnerships changed the picture drastically by having gender-specific impacts on the benefits of mobility, supporting the assumption of the third hypothesis: While female graduates benefited from short-distance mobility only if they lived alone, male graduates benefited from long-distance mobility only if cohabiting with their partner. This resulted in decreasing gender gaps in hourly wages when graduates who lived alone became mobile. In contrast, gender gaps increased when graduates cohabiting with their partners became mobile, indicating the significant role of partnerships affecting gendered mobility benefits.

7.4.4 Robustness Checks

To test the credibility of the results, a series of robustness checks was conducted. Using hourly wages as a measure of earnings is a plausible way to adjust raw earnings for differences in working hours and is consistent with the empirical literature. Nevertheless, estimating the results using gross monthly wages could help to understand the broader

picture of mobility benefits. The results showed that, overall, mobility benefits became more visible when using monthly wages instead of hourly wages (see Appendix, Tables A7.9 and A7.10). For female graduates, both short- and long-distance mobility were associated with higher monthly wages when living alone, while cohabiting with a partner significantly reduced these benefits of mobility (see Appendix, Table A7.9). For male graduates, the benefits of short- and long-distance mobility became similarly more pronounced, but cohabiting with a partner played a less decisive role in their mobility benefits (see Appendix, Table A7.10).

To test whether the sample selection of graduates had a biasing effect by including graduates with very different numbers of working hours, the analyses of Tables 7.3 and 7.4, model 2 and 3, were repeated with a more restrictive sample by increasing the number of minimum working hours to 30 hours per week. The results on the gender- and cohabitation-specific mobility benefits were stable when referring to the more restrictive sample (see Appendix, Table A7.11). However, a reduction in sample size was also associated with a reduction in statistical power, which tended to increase the uncertainty of the estimates.

A further robustness check was conducted using different cut-off values for defining the distance in mobility, by using 30-minute intervals instead of 90 minutes (see Appendix, Tables A7.12 and A7.13). Overall, the gender-specific findings on short- and long-distance mobility and their interaction with cohabiting partners were reflected in the robustness check. For female graduates, the categories 30-60 minutes and 60-90 minutes showed to be most decisive (see Appendix, Table A7.12), whereas for male graduates mobility in the range of 90-120 minutes and 120-150 minutes played the largest role (see Appendix, Table A7.13).

Moreover, results on cohabiting graduates in Figure 7.1 were tested by including additional information on partners' educational background (higher education degree vs. no higher education degree), partners' employment status (not employed, part-time employment, and full-time employment), and the age difference to the cohabiting partner (see Appendix, Figure A7.2). The results were robust to adding these controls, suggesting that none of them could serve as an explanation for the gender-specific mobility benefits among cohabiting graduates.

Furthermore, a Blinder-Oaxaca decomposition analysis of the gender gap in hourly wages was conducted to better disentangle the gender- and partner-specific impact of mobility

from influences that may arise because male and female graduates used certain types of mobility differently (Jann, 2008) (see Appendix, Table A7.14). For cohabiting graduates, the decomposition shows that the raw and unbalanced gap in hourly wages was €1.91, compared to €2.01 for graduates living alone. Gender differences in the endowments of graduates' mobility decisions were relatively small and did not contribute much to explaining the gender gap, reflecting the similar use of mobility by male and female graduates. In contrast, gender differences in the returns to long-distance mobility accounted for a significant portion of the gender gap in hourly wages ($b = 0.64$; $p < .05$) for graduates cohabiting with a partner. For graduates living alone, the gender gap in hourly wages tended to be larger once gender differences in the returns to short-distance mobility were taken into account ($b = -0.40$; $p < .10$). This shows that it was not the different use of mobility by male and female graduates, but mainly the difference in gender-specific returns to short-distance mobility that tended to reduce gender differences in earnings when graduates lived alone, while the gender-specific returns to long-distance mobility led to increasing gender differences in earnings when graduates cohabited with a partner.

Additionally, heterogeneity analyses were undertaken to improve the generalizability of results. In particular, higher mobility benefits could be expected for graduates with high-status aspirations, high academic skills, certain fields of study (e.g., sciences or economics), or certain characteristics of the study region. The robustness check showed that the results on males' and females' partner-specific mobility benefits were largely comparable across different levels of status aspirations, academic skills, and fields of study (see Appendix, Tables A7.15–A7.17). Yet, the following differences were found: Male cohabiting graduates had slightly higher mobility benefits when having high status expectations (see Appendix, Table A7.15). Female cohabiting graduates tended to have lower benefits from short-distance mobility when having high grades (see Appendix, Table A16). And having studied within the field of arts and humanities tended to reduce mobility benefits for female graduates living alone (see Appendix, Table A7.17).

Concerning regional characteristics, women without a cohabiting partner who studied in urban, highly populated regions received significantly higher benefits from short-distance mobility than their counterparts who studied in more rural regions (see Appendix, Table A7.18). This finding is consistent with the evidence-based assumption that women are more privileged and have more mobility opportunities when they live in metropolitan

areas (Hirsch et al., 2013). Male graduates cohabiting with their partner and (to a lesser extent) female graduates living alone benefited more from staying in the study region the higher the regional income level was (see Appendix, Table A7.19). For male graduates cohabiting with their partner, this pattern was also found with regard to the share of service sector occupations in the study region (see Appendix, Table A7.20). This suggests that especially male graduates cohabiting with their partner used mobility more strategically than other graduates to escape potentially lower earnings in low-income study regions with less occupational opportunities.

7.5 Discussion and Conclusions

This study addressed the complex ways in which earnings in the first job are affected by graduates' use of spatial mobility by highlighting the role of gender differences in partner dependencies. The study combined and extended different strands of research on graduates' mobility benefits (French et al., 2020; Jewell & Faggian, 2014; Kazakis & Faggian, 2017; Kidd et al., 2017; Venhorst & Cörvers, 2018) and on the gender-specific use of mobility (R. Crane, 2007; Kley & Drobníč, 2019; McQuaid & Chen, 2012; Nisic, 2009; Nisic & Abraham, 2015). Based on household economics and gender role considerations, this study argued that examining graduates' gender-specific benefits of mobility decisions must also reflect social interdependencies that evolve through partnerships.

The first hypothesis assumed that graduates achieve higher earnings if they became mobile for their first job. Based on human capital theory (Sjaastad, 1970), the study argued that graduates use mobility as an investment to access better-paying jobs, e.g. by having a broader job search horizon. I find support for this assumption by showing that graduates who became mobile achieve on average 4 to 5% higher earnings (measured in hourly wages) compared to graduates who stayed at the place of study. This pattern was found to be robust to self-selection mechanisms of mobile graduates for both short- and long-distance mobility. The finding of small but evident mobility benefits is in line with previous research from the UK (Jewell & Faggian, 2014; Kidd et al., 2017).

The study extended the literature by looking specifically at gender differences in graduates' mobility benefits (e.g., Jewell & Faggian, 2014; Kazakis & Faggian, 2017; Kidd et al., 2017). Based on considerations about graduates' young age, academic orientation, and changing gender roles, it was argued that overall gender differences in graduates' mobility benefits should be small (Hypothesis 2). The results show that male and female

graduates had very similar patterns in their use of mobility, but there are some differences in the benefits of mobility: Female graduates benefited from short-distance mobility in terms of higher earnings, whereas male graduates benefited from long-distance mobility. However, as differences exist primarily in the type of mobility, mobility in general was neither more beneficial for male nor for female graduates. Importantly, this should not obscure the overall gender pay gap that still exists among graduates (e.g., García-Aracil, 2007) and has been described extensively. According to the results on mobility benefits, the overall gender difference in earnings decreases when graduates move shorter distances compared to graduates who stay in their study region, while it increases when graduates move longer distances.

In addition, it should be noted that different mobility decisions have different social and financial costs. While it can be assumed that most home-comers have a social network and parents in their surroundings, starting a job in a new region may often be associated with higher costs. It is also likely that short- and long-distance mobility are associated with different costs: While short-distance mobility may provide a closer connection to the previous place of residence and sometimes offer possibilities of commuting, long-distance mobility is likely to be more cost-intensive as the distance increases. One possible explanation for why male graduates particularly benefit from long-distance mobility is that wage differentials in typically male occupations (e.g., STEM occupations) are more regionally concentrated (Anger et al., 2021), which is why men on average have to move farther away in order to gain earnings advantages. Typically female occupations (e.g., health occupations) are more evenly distributed across the country, and graduates in this sector may additionally benefit from better personal connections from local networks to neighboring regions within a shorter distance (Comunian et al., 2017). In addition, because men are more likely to consider telecommuting as an option than women (Kley & Reimer, 2023), male graduates may tend to value mobility costs for job opportunities in distant regions lower than female graduates.

Considering the complex process of graduates' mobility decisions, it is reasonable to assume that partner dependencies are a relevant factor. Based on the theory of household economics (Mincer, 1978), marital power theory (e.g., Rodman, 1972; Smits et al., 2003), and gender role theory (e.g., Lindsey, 2020; Ridgeway, 2009), this study assumed that cohabiting partnerships lead to increasing gender differences in mobility benefits due to often higher income prospects of the male partner as well as related

resources, bargaining power, and assigned gender roles in partnerships about primary earners. Specifically, this study hypothesized that female graduates have lower and male graduates have higher mobility benefits if they cohabit with a partner (Hypotheses 3). The results support these assumptions by showing that the benefits from short-distance mobility were only valid for female graduates who did not cohabit with a partner, while male graduates only benefited from long-distance mobility if they were cohabiting with a partner. This implies that women, on the one hand, make more career-beneficial mobility decisions in the absence of a cohabiting partner, likely because they do not have to compromise on locational choices but can make mobility decisions independently. Men, on the other hand, are likely to be empowered in their role as male breadwinners in the presence of a female cohabiting partner and make more beneficial mobility decisions.

In summary, the gender earnings gap was reduced if graduates who lived without a partner became mobile (especially over shorter distances), while the gap increased if graduates who cohabited with their partner became mobile (especially over longer distances). The findings on gender-differential partner effects align with previous research on working couples which has suggested that women have lower career benefits from mobility than men (e.g., Kley & Drobnič, 2019; McQuaid & Chen, 2012; Nisic, 2009; Nisic & Abraham, 2015). The results show that partnership dependencies create gender imbalances in mobility benefits that are otherwise relatively evenly distributed or even more advantageous for female graduates. This has so far often been overlooked by other studies on graduate mobility (e.g., Comunian et al., 2017; Venhorst & Cörvers, 2018). These imbalances in the returns to mobility among partnered graduates explain significant parts of the gender pay gap among graduates that are likely to widen over time (Sánchez-Mangas & Sánchez-Marcos, 2021), leading to increasingly unequal career paths. Having ruled out observable differences in graduates' mobility decisions, it can therefore be concluded that partnerships serve as an important signpost for the impact of gender-specific mobility decisions and thus also for gender inequalities in the labor market.

Robustness checks revealed that the study's results were largely independent of differing operationalizations and additional partner information. Differences in mobility benefits by field of study, status aspirations, and academic skills of graduates were present but rather small. Notably, it was found that male partnered graduates – in contrast to other graduates – benefited more from staying and less from becoming mobile if they studied in a region with a high income level and a high share of service sector occupations. This

implies that partnered males use mobility more strategically for their careers if the opportunities in the study region are few, whereas staying in the study region is especially useful when having studied in more privileged regions. Therefore, gender differences in mobility benefits among partnered graduates show to be related to males' strategic region-dependent mobility decisions.

7.5.1 Limitations

Of course, there are limitations of the study to be considered. It was not possible to disentangle the exact mechanisms through which gendered mobility benefits arise for graduates living in partnerships: To what extent household economic benefit calculations, power differences due to gendered human resources, and assigned gender roles in partnerships impact gendered mobility decisions and benefits could not ultimately be clarified. This task was complicated by the fact that this study used individual panel data with restricted information on partners. Future research might use household data to quantify those mechanisms and additionally rely on qualitative research methods to gain deeper insights.

Another limitation of the study is that it could only measure spatial mobility across the borders of administrative districts (NUTS-3 regions). Therefore, it is likely that the extent of short-distance mobility was underestimated. Nevertheless, the study was able to distinguish three types of mobility (home-comers, short-distance mobility, and long-distance mobility) which offer a differentiated perspective of graduates' mobility decisions.

Moreover, I could not clearly identify if individuals moved to the new regions or (tele)commuted from their study region across the borders of the administrative districts. However, since all types of mobility (moving, commuting, and telecommuting) can be seen as an investment in mobility leading to a broader job search horizon, no differential impacts of each type would be assumed on a theoretical basis.

It should also be noted that although the NEPS-SC5 data provided very rich and useful longitudinal information on graduates in Germany, the sample was selective due to teacher-student oversampling and due to panel attrition. By using entropy balancing weights that also control for selectivity in the oversampling (e.g., student teachers) and for sampling relevant characteristics (e.g., migration background) the study made the best

effort to avoid sampling biases. Yet, the possibility of selection on unobservables cannot be ultimately ruled out.

Finally, as this study focused on the first job after graduation as a unique life event in young adults' careers, I decided not to model career trajectories which would have allowed the use of longitudinal methods. How gender-specific mobility benefits change in the first years of young adults' careers will therefore be a subject of further research.

7.5.2 Conclusion

The objectives of this study were to examine whether graduates benefit from spatial mobility in terms of higher earnings, whether these mobility benefits differ by gender, and the extent to which gender differences in mobility benefits and earnings are affected by having a cohabiting partner. The findings have many practical implications for society and policymakers. By showing that mobility benefits exist for both men and women, one important message is that spatial mobility is already often used by graduates to obtain higher-paying jobs. Moreover, gender differences in graduates' mobility benefits are relatively balanced and depend on the distance over which graduates become mobile, indicating that female graduates are not disadvantaged in their mobility benefits per se. However, this study provided evidence that the emergence of gender inequalities in graduate mobility benefits is strongly associated with cohabiting partnerships. This implies that the interconnectedness of lives in cohabiting partnerships goes along with mobility decisions that lead to a widening gender pay gap among graduates. This shows that further political and societal attention and effort are needed to counteract gender roles and gender-biased mobility decisions in partnerships so that women's careers can similarly benefit from mobility as men's do. Another concern is that, with the exception of partnered men, graduates from low-income study regions are not overcoming regional disadvantages, even if becoming mobile, which is why especially female graduates should be encouraged and informed about career chances through spatial mobility already when deciding on a place of study. At the same time, policymakers should consider that spatial mobility can further weaken already disadvantaged regions and should therefore take measures to improve the labor market infrastructure in these regions.

8. Study 3: From Playground to Promotion: How Local Public Childcare Shapes Parents' Gendered Career Trajectories

8.1 Introduction

Women continue to earn less than men (F. D. Blau & Kahn, 2017), have significantly flatter earnings trajectories (Doren, 2019), and remain underrepresented in leadership positions (Schultheiss, 2021). These inequalities have persisted despite decades of political and societal efforts to promote gender equity (England et al., 2020; Woo et al., 2023). A large share of these gender gaps is closely tied to parenthood and gendered career interruptions (F. D. Blau & Kahn, 2017; Goldin, 2022). While the birth of a child often marks a turning point in mothers' careers (Cukrowska-Torzewska & Matysiak, 2020; Kleven et al., 2024), it is usually no obstacle to fathers' careers (Mari, 2019; van Winkle & Fasang, 2020).

The provision of public childcare has been politically promoted to increase the compatibility of family and work and to reduce mothers' career disadvantages (Sharma & Steiner, 2008). An important strand of research has focused on the introduction of major childcare and family policy reforms (Bauernschuster & Schlotter, 2015; Bettendorf et al., 2015; Geyer et al., 2015; Zimmert, 2023). This research has indicated that in times of family-friendly policies, mothers are likely to return to the labor market more quickly after entering parenthood.

To reflect regional differences in public childcare infrastructure, it has been a common strategy to look at the local public childcare coverage, measured by the rate of children under a certain age who attend public childcare institutions (Zoch & Hondralis, 2017). Previous research across various countries has suggested that the local public childcare coverage contributes to mothers' labor force participation after childbirth (e.g., Brilli et al., 2016; Dujardin et al., 2018; Kalíšková & Münich, 2023; Scherer & Pavolini, 2023; van Ham & Mulder, 2005; Zoch, 2020; Zoch & Hondralis, 2017).

Beyond that, little is known about whether the local public childcare coverage also reduces gender differences in career prospects in the long run. Long-term consequences

are especially relevant because they can affect not only lower wage growth and slower career progression (Angelov et al., 2016; van Winkle & Fasang, 2020), but also pension entitlements and the risk of poverty in old age (Möhring, 2018). Results from two studies focusing on Germany and the municipality of Bern, Switzerland, have suggested that a higher coverage correlates with both mothers' earnings and their likelihood of attaining managerial positions (Chhaochharia et al., 2017; Krapf et al., 2021). However, more research is needed to assess the association between the local public childcare coverage and long-term career advancement.

Moreover, previous research has largely focused on the careers of mothers (e.g., Brilli et al., 2016; Cascio, 2009; Dujardin et al., 2018). Because mothers are typically more involved in childcare than fathers, public childcare is expected to play a gendered role (Bian et al., 2024). However, it is unclear to what extent fathers' careers are affected less than mothers' careers. To find out whether the local public childcare coverage specifically improves mothers' career prospects or rather leads to benefits for both parents, it is important to study fathers' and mothers' careers comparatively.

In addition, effects of the local public childcare coverage might be heterogeneous (Bian et al., 2024; Wood et al., 2018): Fathers who take on care responsibilities may be more sensitive to the public childcare infrastructure than those who provide the main family income and are less involved in care tasks (Becker, 1991). Consequently, both mothers and fathers may benefit from public childcare when they share responsibility for both paid and unpaid work. In recent years, greater heterogeneity in the division of labor among couples has been observed (Neilson & Stanfors, 2018). However, not much is known about the benefits of public childcare for parents' careers in light of couples' division of labor (Bian et al., 2024).

To this end, this study addresses the following two research questions: *(1) Does the local public childcare coverage affect the time it takes fathers and mothers to advance their careers through wage increases and promotions to leadership positions after entering parenthood? (2) Does the association between local public childcare coverage and career advancements vary with couples' gender-specific division of labor?*

By using longitudinal data from the German Socio-Economic Panel (GSOEP), the study benefits from a representative and well-established data set on German households (Goebel et al., 2019). The GSOEP covers individuals' entry into parenthood, career trajectories, and household dynamics. We used the last 16 survey years, from 2006 to

2021, to model parents' career trajectories. Examining wage increases, both monthly and hourly, as well as the attainment of leadership positions, helps to gain a more comprehensive perspective on parents' career advancement than studying a single dimension would.

Overall, our study contributes to the literature on the role of public childcare for parents' careers in three ways: First, it extends previous research that has primarily focused on mothers' immediate return to the labor market after childbirth by examining long-term impacts on career trajectories. Second, the comparative focus of this study on the career trajectories of both mothers and fathers complements previous research that has primarily looked at the careers of mothers. Third, this study generates new insights by examining how public childcare is related to career advancement among couples with different gendered divisions of labor.

8.2 Background

8.2.1 Public Childcare and Parents' Careers

Following a rational choice framework, parents use public childcare based on perceived costs and benefits (Steinberg & Kleinert, 2022). The costs can be differentiated into direct costs for using public childcare, and indirect costs such as earnings losses when temporarily exiting the labor market to take over care responsibilities. Benefits of using public childcare may be seen in its educational purpose for children's development (Ghirardi et al., 2023). Beyond that, the flexibility that parents can use for their own life goals can be a benefit. Parents can use this time to stay in the labor force, return to work earlier after childbirth, or work longer hours. This higher work commitment can be expected to translate into faster career advancement (Van der Heijden et al., 2022). Hence, parents' access opportunities to public childcare, as reflected by the local public childcare coverage, may affect parents' career trajectories: We expect a higher local public childcare coverage to reduce the time that parents need to attain career advancement (Hypothesis 1).

8.2.2 The Gendered Role of Public Childcare

Gender differences in working hours and wages often increase with the onset of parenthood (Dunatchik, 2023; Kühhirt, 2012; Wood et al., 2018), because mothers frequently leave the labor market and often reenter only in part-time jobs (Doren & Lin,

2019; Landivar, 2015). Given these gender differences in careers, the local public childcare coverage may not be equally relevant for fathers compared to mothers.

From a household economic perspective, family members can be expected to specialize in specific tasks in order to maximize the family's overall utility (Becker, 1991). Women often work in occupations that pay less than those of their male partners, resulting in lower contributions to household income (Charles, 2017; Charles & Grusky, 2005; Leuze & Strauß, 2016). Therefore, it is often a rational decision for women to devote themselves more to care work and for men to concentrate on paid work after the birth of a child (Kühhirt, 2012).

Beyond rational choice approaches, sociological perspectives have emphasized gender as part of the social structure in society that shapes cultural beliefs about appropriate behavior, performance levels, and evaluations (Ridgeway & Correll, 2004; Risman, 2004). Occupational preferences that translate into occupational choices are framed by the perception of gender-appropriate occupations (Gottfredson, 1981). Gender-specific self-selection into differently paid occupations is therefore not just a rational decision but also a consequence of normative evaluations based on gendered socialization (Charles & Grusky, 2005). Thus, although households' decisions on the division of labor are often justified by rational arguments, these might be rooted in norms and expectations on gendered occupational choices (Charles, 2017).

Furthermore, normative expectations about gender can be perpetuated through social interactions (West & Zimmerman, 1987), which can lead to a gender-specific division of labor (Dunatchik, 2023; Zoch & Heyne, 2023). Specifically, the roles ascribed to mothers and fathers differ in that mothers are more frequently expected to care for children and interrupt their careers, whereas fathers are typically expected to provide the family's main income (Höfner et al., 2011; Lorber, 1994; Schmader & Block, 2025). Because parents must divide and negotiate new household tasks, childbirth may contribute to the reinforcement of traditional gender roles (Katz-Wise et al., 2010; Kühhirt, 2012).

Overall, we expect public childcare to help mothers in particular to better balance family and career (Bauernschuster & Schlotter, 2015), enabling them to pursue their careers more effectively. However, fathers can be expected to continue their careers more independently of public childcare. We hypothesize that a higher local public childcare coverage reduces the time to career advancement for mothers more than for fathers (Hypothesis 2).

8.2.3 Couples' Division of Labor and Public Childcare Benefits

Because couples differ in how they divide work and care responsibilities (Büchau et al., 2023; Landivar, 2015), it is reasonable to assume that the role of public childcare also depends on family roles and work values (Johnson, 2005). Fathers who correspond to the role of the male breadwinner are little involved in childcare duties (Höfner et al., 2011) and public childcare can be expected to play a minor role for their careers. They could even indirectly benefit from a lower public childcare coverage, which often coincides with mothers staying home with their children instead of participating in the labor force (Bauernschuster & Schlotter, 2015). This could further relieve fathers from domestic work and increase the family's dependence on the father's career and income (Bünning, 2020). However, the rise of egalitarian gender values (Pampel, 2011; Woo et al., 2023) and the growing number of highly qualified women in the workforce (Klesment & Van Bavel, 2016) make it more likely that families deviate from traditional work and care roles (Zoch & Heyne, 2023). Additionally, increased costs and stagnant wage growth often require both partners to work (Leonce, 2020). Therefore, it can be assumed that fathers are a diverse group and that access to local public childcare infrastructure is more important to those who share work and caregiving responsibilities more equally within their partnerships and play an active role in housework and childcare.

Similarly, mothers in dual-earner households may benefit more from public childcare than mothers in male-breadwinner households. Although mothers' labor force participation has increased, they are often still expected to take on primary responsibility for childcare (Fanelli & Profeta, 2021; Maclean et al., 2021). Public childcare may therefore enable labor-market attached mothers in particular to shift their focus more toward their careers.

One counterargument is that mothers who were less involved in the labor market before becoming parents may not plan their children's access to public childcare in advance (Bian et al., 2024). Therefore, they may be more dependent on local public childcare coverage than mothers who are involved in the labor market. However, the crucial question is whether less labor-market-attached mothers would reconsider their career options if public childcare were more available, or if the caregiving norm would remain prevalent. Evidence has shown that gender role attitudes and the division of labor become more traditional with the onset of parenthood (Katz-Wise et al., 2010; Kühhirt, 2012; Syrda, 2023). Therefore, it is plausible that mothers who have contributed less to their

household income before entering parenthood would rather not change their internalized work and care roles, regardless of public childcare infrastructure.

Overall, we expect mothers and fathers in dual-earner households to benefit more from local public childcare coverage for their career advancement than mothers and fathers in households with a male breadwinner (Hypothesis 3).

8.2.4 The German Context

Germany is a particularly interesting and suitable study context, as mothers in Germany face larger career constraints than in many other countries (Kleven et al., 2024), which allows us to analyze to what extent these constraints are associated with local public childcare. Furthermore, the local public childcare coverage varies significantly over time and across different local contexts in Germany (BMI, 2022), with notable differences between urban and rural areas (Lochner & Kopp, 2022). Additionally, a significant east-west divide remains; in 2021, 31% of children under the age of three attended public childcare in western German regions, compared to 52% in eastern regions (Federal Statistical Office, 2021). This low rate of childcare in western Germany aligns with the characterization of the country as a conservative, family-oriented welfare state (Zoch & Hondralis, 2017). In contrast, East Germany, a sovereign socialist state until 1989, has been characterized by high female labor force participation and widespread childcare facilities (Zoch, 2020).

Over the past two decades, German family and childcare policies have gradually changed due to the increasing demand for childcare and the growing number of women in the workforce. These changes have led to an expansion of public childcare (Stahl & Schober, 2018; Zoch, 2020). Beginning in 2005 with the Daycare Expansion Act (*Tagesbetreuungsbaugesetz*) and followed shortly by the Childcare Funding Act (*Kinderförderungsgesetz*) in 2008, the number of available childcare places has been steadily increased. Since 2013, parents have a legal right to public childcare for their child starting at age one (Stahl & Schober, 2018). However, public childcare for children under three is still insufficient in most areas, as parents' demand continues to exceed available services (Meiner-Teubner et al., 2024). These circumstances enable us to estimate the impact of existing differences in public childcare on parents' career advancement.

8.3 Data and Methods

8.3.1 Data

The study used data from the German Socio-Economic Panel from 1984 to 2021 (GSOEP), a longitudinal and representative dataset of German households. We enriched the GSOEP data, including all subsamples, with regional data from the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) at the level of administrative districts, which is equivalent to Level 3 of the Nomenclature of Territorial Units for Statistics (NUTS-3). Because regional characteristics, such as the local public childcare coverage, have changed over time, all regional data were used for the year of childbirth. As childcare for children under the age of one is very rarely offered in Germany (Meiner-Teubner et al., 2024), the year of birth was deemed the most appropriate reference point. Our analytical sample focuses on career trajectories between 2006 and 2021 because data on local public childcare coverage has only been available since 2006.

The following selection criteria were applied to ensure the comparability of parents' career trajectories, excluding the respective cases from the sample (see Appendix, Table A8.1): individuals who did not report a first childbirth between 2006 and 2019, ensuring that parents' career trajectories could be tracked for at least two years after childbirth ($N = 65,645$), individuals who became parents before the age of 18 or after the age of 45 ($N = 1,638$), individuals who were never an active part of the labor force ($N = 12,658$), individuals for whom the first available employment information in the data was before the age of 15 or after the age of 50 ($N = 271$), individuals who worked in the armed forces ($N = 44$), individuals in households with children under 13 prior to entering parenthood ($N = 32$), individuals who did not participate in the survey before or after entering parenthood ($N = 4,999$), and individuals in households with more than two adults ($N = 1$).

To avoid sample bias due to selectiveness in missing values, we imputed missing information by applying multivariate imputation by chained equations (van Buuren & Groothuis-Oudshoorn, 2000), and estimated $M = 20$ plausible values for each missing value (for an overview of all incomplete and imputed values, see Appendix, Table A8.2). By doing so, our sample consisted of $N = 2,398$ parents, including 1,212 mothers and 1,186 fathers, representing 2,055 individuals in couple households and 343 single-parent households. On average, individuals worked 35.58 hours per week and had a monthly gross income of €2,549.59 prior to becoming parents. 904 parents reported the birth of a second child within the observation period. For the analysis of the attainment of

leadership positions, we excluded 464 parents who attained a leadership position before becoming parents, leaving a subsample of $N = 1,934$ parents.

8.3.2 Variables

The outcome of interest was parental career advancement, for which we used three related measures: monthly wage gains, hourly wage gains, and the attainment of leadership positions. We considered *monthly wage gains* by using the time it took parents from the birth of their child to increase their gross income by 20%, compared to their gross income before becoming parents. We considered *hourly wage gains* by including the number of contract hours worked, measuring the time it took parents to increase their hourly wages by 20%. While monthly wage gains reflect overall income gains, hourly wage gains additionally account for differences in labor market participation and working hours. As there is no universally shared definition of career advancement, we also tested alternative thresholds including wage gains of 10% and 30% in a robustness check (see Appendix, Figures A.8.1 and A.8.2). The use of relative wage gains instead of absolute gains was motivated to account for differences in baseline earnings and the steepness of career trajectories. This allows for a more comparable measure of career advancement across individuals with heterogeneous initial wage levels. Robustness checks using absolute wage gains are provided in Appendix (see Figure A8.3).

For the third measure on career advancement, we considered the time it took parents to attain a *leadership position*, which reflects positional career advancement and complements the wage indicators. To do so, we used data on parents' occupational positions, which provided information on management task performance and number of employees, differentiated by employment type. We transformed this information into a binary variable indicating whether individuals were in a leadership position. When this information was ambiguous, as was the case for highly qualified employees and civil servants, we relied on individuals' self-assessments regarding whether they supervised others at work ($N = 538$). This question was asked every two years and was lagged by one year if individuals remained in the same job position.

The time to career advancement was estimated by counting the number of months from the date of childbirth to the first interview at which the career advancement was assessed. On average, it took mothers longer to achieve career advancement. The average time-to-event for mothers (and fathers) was 61 months (41 months) for monthly wage gains, 51 months (40 months) for hourly wage gains, and 66 months (52 months) for

attaining a leadership position. The overall distribution of the time measures for career advancement, as well as of all other variables used, can be found in Table 8.1.

Table 8.1. Distribution of Variables.

Variables	Mean	SD	Range	N
<i>Outcome variables:</i>				
<i>t</i> (monthly wage gain) ^a	51.03	40.99	1 – 188	2,398
<i>t</i> (hourly wage gain) ^a	45.55	37.57	1 – 188	2,398
<i>t</i> (leadership position) ^a	59.22	44.20	1 – 188	1,934
<i>Regional variables:</i>				
Local public childcare coverage (std.) ^b	0.00	1.00	-1.89 – 2.63	2,398
Unemployment rate (std.) ^b	0.00	1.00	-1.66 – 4.18	2,398
GDP per capita (std.) ^b	0.00	1.00	-1.28 – 7.11	2,398
Share of large firms (std.) ^b	0.00	1.00	-2.20 – 3.78	2,398
Population density (std.) ^b	0.00	1.00	-0.87 – 2.86	2,398
Conservative voters (std.) ^b	0.00	1.00	-2.31 – 3.75	2,398
Living in former East Germany (ref. West)	0.16	0.36	0 – 1	2,398
<i>Individual variables:</i>				
Gender: male (ref. female)	0.49	0.50	0 – 1	2,398
Low education (ref.)	0.31	0.46	0 – 1	2,398
Medium education	0.27	0.44	0 – 1	2,398
High education	0.42	0.49	0 – 1	2,398
Migration background (ref. no migration background)	0.32	0.47	0 – 1	2,398
Type of work: High-skilled white-collar (ref.)	0.60	0.49	0 – 1	2,398
Type of work: Low-skilled white-collar	0.21	0.40	0 – 1	2,398
Type of work: High-skilled blue-collar	0.11	0.31	0 – 1	2,398
Type of work: Low-skilled blue-collar	0.09	0.28	0 – 1	2,398
Labor force experience (std.) ^c	0.00	1.00	-2.91 – 4.12	2,398
Employed (ref. not employed) ^c	0.87	0.33	0 – 1	2,398
Hours worked (std.) ^c	0.00	1.00	-2.89 – 2.11	2,398
Health status: good (ref. not good) ^c	0.74	0.44	0 – 1	2,398
Age (std.) ^b	0.00	1.00	-2.62 – 2.71	2,398
Relocation (ref. no relocation) ^d	0.39	0.49	0 – 1	2,398
Partner (ref. no partner) ^c	0.90	0.31	0 – 1	2,398
Year of childbirth: 2006 (ref.)	0.07	0.26	0 – 1	2,398
2007	0.06	0.24	0 – 1	2,398
2008	0.05	0.23	0 – 1	2,398
2009	0.05	0.22	0 – 1	2,398
2010	0.12	0.32	0 – 1	2,398
2011	0.06	0.23	0 – 1	2,398
2012	0.06	0.23	0 – 1	2,398
2013	0.07	0.26	0 – 1	2,398
2014	0.08	0.27	0 – 1	2,398
2015	0.08	0.27	0 – 1	2,398
2016	0.08	0.27	0 – 1	2,398
2017	0.07	0.26	0 – 1	2,398
2018	0.09	0.28	0 – 1	2,398
2019	0.06	0.25	0 – 1	2,398
Couples' division of labor: male-breadwinner household (ref. dual-earner) ^c	0.48	0.50	0 – 1	2,055

Note. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

t = Time in months counting from the start of parenthood. ^a Duration in months between entering parenthood and experiencing an event, i.e. attaining career advancement or dropping out of the sample. ^b Measured when entering parenthood. ^c Measured prior to entering parenthood. ^d Measured in the period of two years prior to entering parenthood.

The main predictor variable was the local public childcare coverage, proxied by the local rate of children under the age of three attending public childcare at the district level. This measure has advantages over information on parents' direct use of public childcare. Parents who use public childcare early on differ from other parents, forming a positively selective group in terms of education and income (Wood et al., 2023), which makes it difficult to identify the role of public childcare in parents' careers. The local public childcare coverage is a composite measure, reflecting both supply and demand. However, due to undersupply—more parents looking for a spot for their child than spots available—the measure is expected to primarily reflect local differences in public childcare availability and has been widely used by previous research to estimate associations with mothers' labor force participation (Scherer & Pavolini, 2023). Figure 8.1 shows the distribution of the variable across local districts for 2006 and 2019, representing the beginning and the end of our observation period for reported births. In addition to an extensive increase in public childcare rates over time, substantial differences exist between former East and West Germany.

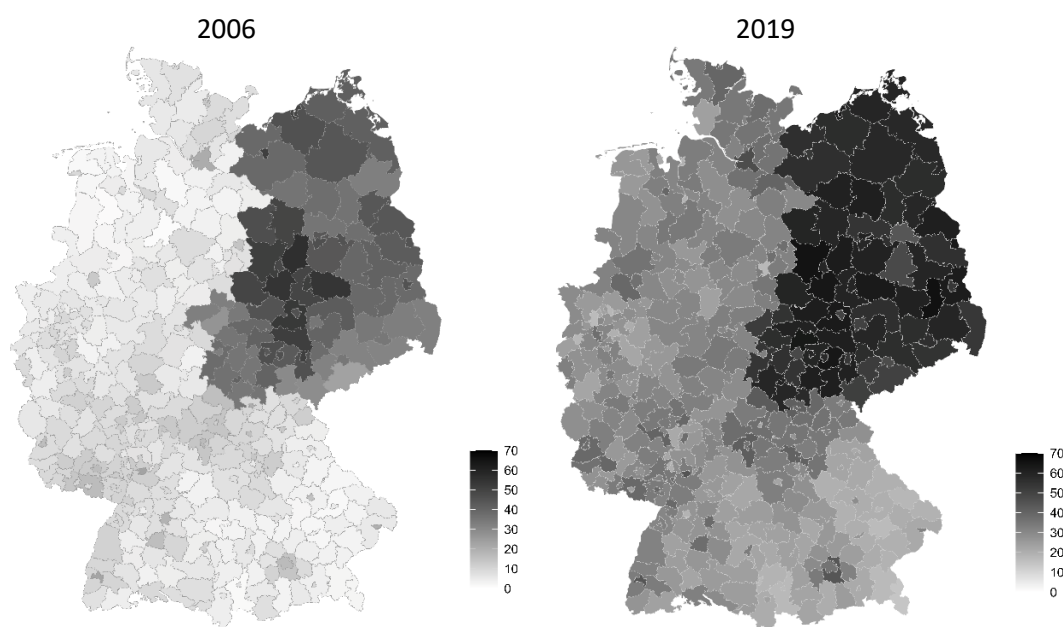


Figure 8.1. Distribution of the Rate of Children Under Three Attending Public Childcare (in %) Across Local Districts and Over Time.

Note. Data source: BBSR – INKAR database.

To distinguish between mothers and fathers empirically, we referred to self-reported gender. Furthermore, we classified couples as either male-breadwinner or dual-earner households based on the gross monthly income prior to entering parenthood. Following the empirical literature (Bian et al., 2024), we defined *male-breadwinner couples* as those where the male partner contributed 55% or more of the household income, and *dual-earner couples* as those where his share was below 55%. Using pre-parenthood income information helps mitigate endogeneity concerns, as the local availability of public childcare may itself influence how couples divide paid and unpaid work after becoming parents. Although 55% may seem a relatively low cutoff, the division of labor typically becomes increasingly unequal with the transition to parenthood (Dunatchik, 2023). Therefore, our measure is expected to serve as a reasonable proxy for post-parenthood labor division without being endogenous to local public childcare. Robustness checks for alternative thresholds are presented in Appendix (see Figures A8.4–A8.6).

To avoid confounding bias, we considered regional control variables at the level of districts (NUTS-3). Local labor markets with better economic situations and more urban areas may have more financial resources to increase and maintain higher levels of public childcare coverage. These local contexts may also offer individuals better career advancement opportunities. Thus, we controlled for local unemployment rates, gross domestic product, and the share of large firms. To account for differences in urbanity, we used population density. Additionally, a more conservative local context may hinder investment in a wider range of public childcare services and influence the extent to which mothers and fathers commit to their careers. Thus, we used the share of voters for the German conservative party (CDU/CSU) to reflect local conservatism. To account for residual structural differences between former East and West Germany that could affect public childcare coverage, we included information on whether the place of residence was in the east or west.

Additionally, we considered individual-level covariates to account for potential self-selection into local contexts that might equally relate to childcare coverage and career advancement (Arntz et al., 2023). To reduce the risk of including characteristics that could themselves be influenced by local public childcare infrastructure, we fixed the timing of measurement and relied on pre-parenthood information for relevant time-varying variables. We controlled for individuals' educational background based on the widely used classification of Comparative Analysis of Social Mobility in Industrial Nations

(CASMIN) (König et al., 1988), differentiating between *low* (CASMIN 1a, 1b, 1c, and 2b), *medium* (CASMIN 2a, 2c_gen, and 2c_voc) and *high* levels of education (CASMIN 3a and 3b). We considered individuals' type of work based on the International Standard Classification of Occupations (ISCO-88) (ILO, 1990), differentiating between *high-skilled white-collar work* (ISCO major groups 1, 2, and 3), *low-skilled white-collar work* (ISCO major groups 4 and 5), *high-skilled blue-collar work* (ISCO major groups 6 and 7), and *low-skilled blue-collar work* (ISCO major groups 8 and 9). Furthermore, we controlled for the following factors: individuals' migration background (*yes* vs. *no*), living with a partner prior to entering parenthood (*yes* vs. *no*), self-rated health prior to entering parenthood (*good* vs. *not good*), age at the time of entering parenthood, labor force experience prior to entering parenthood in months, employment status prior to entering parenthood (*employed* vs. *not employed*), hours worked prior to entering parenthood, and whether individuals moved to another house within two years prior to entering parenthood (*yes* vs. *no*). Finally, to account for unobserved major changes in policy and structural settings, we considered the year of childbirth, ranging from 2006 to 2019.

8.3.3 Analytical Strategy

Applying semi-parametric Cox regression models (Cox, 1972), this study used event history analyses to estimate the time to attain career advancements after entering parenthood. This method has the advantage that it not only reflects changes in outcome variables, but also maps the process until changes happen by incorporating the time until an event occurs (Blossfeld et al., 2019).

The starting time was defined by the date of first childbirth. When parents reported the birth of a second child ($N = 1,089$), an additional record was created that counted the time since the date of the second childbirth in cases where no career advancement had been achieved beforehand. This is why the number of observations deviates from the number of parents. Due to the small number of cases ($N = 133$), parents who reported more than two births during the observation period were treated the same as parents who reported two births. We followed the careers of the parents until they either attained career advancement or dropped out of the survey. In the latter case, the observations were not deleted but right-censored and included in the models, which is another advantage of event history analyses (Blossfeld et al., 2019).

In the first step, we estimated associations of the local public childcare coverage and parents' gender with parents' duration until career advancement. In the second step, we

included regional controls, followed by a third step in which we included individual controls. We repeated the same procedure with an interaction term between parents' gender and the local public childcare coverage included in all three steps. Based on the model with regional and individual controls, we estimated predicted probabilities to make model-based predictions about the time it took mothers and fathers to attain career advancements. For illustrative purposes, we contrasted local contexts with high public childcare coverage, which was 1.5 standard deviations above average, with local contexts with low public childcare coverage, which was 1.5 standard deviations below average.

To model the difference in association between local public childcare coverage and couples' division of labor, we estimated a threefold interaction between the local public childcare coverage, parents' gender, and the division of labor (*dual-earner couples* vs. *male-breadwinner couples*). Only couples living together were included in this step of the analysis, resulting in a sample size of $N = 2,055$ for the analyses of wages and $N = 1,652$ for the analyses of leadership positions. Once again, we estimated model-based predictions over time.

Throughout the models, we used clustered standard errors at the district level to account for potential serial correlations among parents within the same local district. We tested multilevel models with parents nested within districts, however, values of the estimated intraclass coefficient close to zero showed that a more parsimonious model was sufficient.

8.4 Results

8.4.1 Associations Between Local Public Childcare Coverage and Parents' Career Advancement

Table 8.2 shows the associations of the local public childcare coverage and parents' gender with the time to attain career advancement (Panels A-C, Model 1-3). Across all measures of career advancement—monthly wage gains, hourly wage gains, and the attainment of leadership positions—fathers were more likely than mothers to progress.

Consistent with the theoretical assumption of Hypothesis 1, we observed that parents in local contexts with higher public childcare coverage were significantly more likely to advance in their careers (see Table 8.2). The associations with monthly and hourly wage gains remained robust when regional and individual controls were included, as seen in Models 2 and 3 of Panels A and B. However, the association with leadership positions became insignificant when individual controls were included in Model 3 (Panel C).

Table 8.2. Cox Regression of Parents' Time to Attain Career Advancement on the Local Public Childcare Coverage and Parents' Gender.

Panel A: Monthly Wage Gain (+20 %)						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Male (ref. female)	1.00*** [0.07]	1.00*** [0.07]	1.15*** [0.08]	1.03*** [0.07]	1.02*** [0.07]	1.18*** [0.07]
Childcare coverage (std.)	0.20*** [0.04]	0.23*** [0.06]	0.16* [0.07]	0.35*** [0.05]	0.40*** [0.07]	0.32*** [0.08]
Childcare coverage (std.) # male				-0.25*** [0.06]	-0.26*** [0.06]	-0.26*** [0.06]
Regional controls		✓	✓		✓	✓
Individual controls			✓			✓
Person-months	127,962	127,962	127,962	127,962	127,962	127,962
N(observations)	3,212	3,212	3,212	3,212	3,212	3,212
N(persons)	2,398	2,398	2,398	2,398	2,398	2,398
N(events)	819	819	819	819	819	819
Panel B: Hourly Wage Gain (+20 %)						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Male (ref. female)	0.26*** [0.05]	0.25*** [0.05]	0.32*** [0.06]	0.26*** [0.05]	0.25*** [0.05]	0.32*** [0.06]
Childcare coverage (std.)	0.12*** [0.03]	0.18*** [0.05]	0.14* [0.06]	0.14*** [0.04]	0.21*** [0.05]	0.16* [0.07]
Childcare coverage (std.) # male				-0.06 [0.04]	-0.06 [0.04]	-0.05 [0.05]
Regional controls		✓	✓		✓	✓
Individual controls			✓			✓
Person-months	116,328	116,328	116,328	116,328	116,328	116,328
N(observations)	3,132	3,132	3,132	3,132	3,132	3,132
N(persons)	2,398	2,398	2,398	2,398	2,398	2,398
N(events)	1,080	1,080	1,080	1,080	1,080	1,080
Panel C: Leadership Positions						
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Male (ref. female)	0.97*** [0.13]	0.97*** [0.13]	0.92*** [0.14]	0.99*** [0.12]	0.98*** [0.13]	0.93*** [0.14]
Childcare coverage (std.)	0.16** [0.06]	0.27** [0.10]	0.21 [0.13]	0.32*** [0.08]	0.44*** [0.11]	0.40* [0.15]
Childcare coverage (std.) # male				-0.25* [0.10]	-0.27* [0.11]	-0.28* [0.11]
Regional controls		✓	✓		✓	✓
Individual controls			✓			✓
Person-months	116,811	116,811	116,811	116,811	116,811	116,811
N(observations)	2,694	2,694	2,694	2,694	2,694	2,694
N(persons)	1,934	1,934	1,934	1,934	1,934	1,934
N(events)	283	283	283	283	283	283

Note. Cluster-robust standard errors in brackets. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The associations with childcare coverage were also substantial in size: Depending on the type of career advancement, a one standard deviation increase in local public childcare coverage was associated with a 15–23% higher hazard ratio of parents attaining a career advancement (percentages based on coefficients in Table 8.2, Panels A-C, Model 3). In absolute terms, this means that parents in local contexts with a one standard deviation

higher public childcare coverage attained a 20% monthly wage gain approximately 7.5 months earlier, on average. This results in an estimated difference of nearly two years (22.5 months) between parents in local contexts with a high (+1.5 SD) and low (-1.5 SD) coverage. This estimate is based on a hazard ratio of 1.17 and an average time-to-event of 44.1 months among those who attained a monthly wage gain.

8.4.2 Gender-Specific Associations with the Local Public Childcare Coverage

Based on existing knowledge of the differences in career trajectories between mothers and fathers, we hypothesized that local public childcare coverage would play a gendered role in supporting mothers' careers (Hypothesis 2). Table 8.2 (Models 4-6) shows the interaction between the local public childcare coverage and parents' gender (for more detailed results that include estimated coefficients of the control variables, see Appendix, Tables A8.3–A8.5).

The positive main effect of local public childcare coverage in the interaction model suggests that mothers' time to attain career advancement was significantly reduced when local public childcare was more widespread. Furthermore, the negative interaction effect between local public childcare coverage and gender indicates that the likelihood of career advancement for mothers was significantly more affected by local public childcare coverage than for fathers (see Table 8.2, Panels A and C, Models 4-6). This was particularly evident in monthly wage gains and attaining a leadership position. However, no significant differences in benefits were found between mothers and fathers for hourly wage gains (Table 8.2, Panel B, Models 4-6).

Figure 8.2 shows the predicted probabilities of career progression over time after entering parenthood, contrasting parents in local contexts with high (+1.5 SD) and low (-1.5 SD) public childcare coverage. This figure is based on the full model, which includes regional and individual controls (Model 6). As shown, the probability of career advancement increased over time for parents of both genders. However, for mothers in local contexts with low public childcare coverage, the probability of career advancement increased much more slowly than for mothers in local contexts with high coverage. The largest differences in slopes for mothers were observed for attaining leadership positions, followed by monthly wage gains, whereas the differences were considerably smaller for hourly wage gains. For fathers, the predicted time to attain career advancement was only marginally reduced with higher public childcare coverage across all three measures. This

illustrates that local public childcare played a significantly larger role in advancing mothers' careers throughout the observation period.

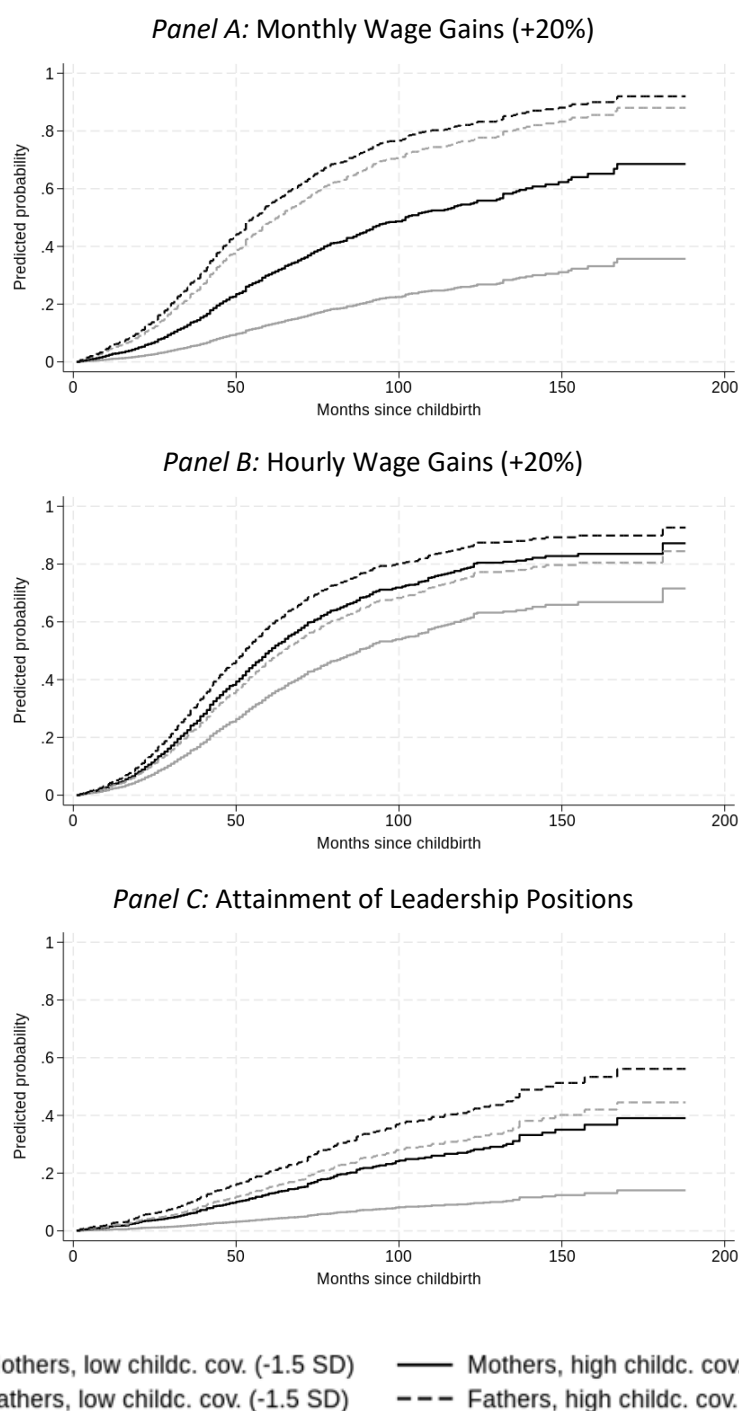


Figure 8.2. Predicted Probabilities of Attaining Career Advancement Over Time After Entering Parenthood by High and Low Local Public Childcare Coverage and Parents' Gender.

Note. Predicted probabilities are based on models that contain a two-way interaction between the local public childcare coverage and parents' gender (see Table 8.2, Model 6). Regional and individual controls are included. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

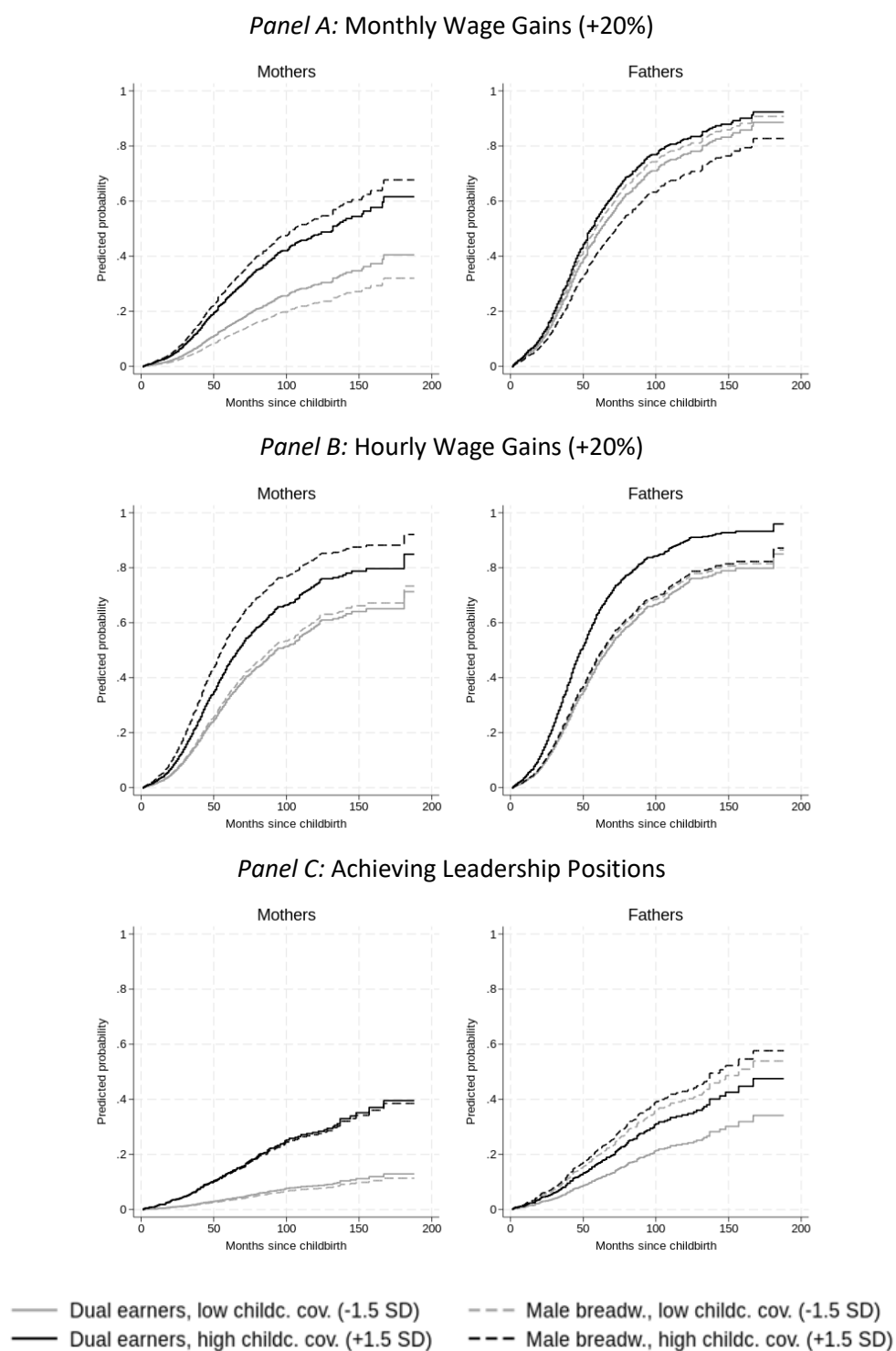


Figure 8.3. Predicted Probabilities of Attaining Career Advancement Over Time After Entering Parenthood by High and Low Local Public Childcare Coverage and Couples' Division of Labor for Mothers and Fathers.

Note. Predicted probabilities are based on models that contain a three-way interaction between the local public childcare coverage, division of labor (dual-earner vs. male-breadwinner), and parents' gender. Regional and individual controls are included. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

8.4.3 The Moderating Role of Couples' Division of Labor

To test the third hypothesis, we included the division of labor as an additional interaction term. This limited the analyses to couples' households. The results showed that there was indeed heterogeneity in how much parents benefited from public childcare in terms of their career advancement (see Figure 8.3). This was particularly true for fathers, who experienced slightly greater benefits from higher public childcare when living in dual-earner households.

However, mothers in dual-earner households did not benefit more from public childcare than mothers in male-breadwinner households. In fact, mothers tended to be even more likely to attain higher monthly and hourly wages when living in a male-breadwinner household. However, these gendered patterns were only at the edge of significance for monthly and hourly wage gains ($p < .10$), and not significant for the attainment of leadership positions ($p > .10$) (for more detailed results on all estimated coefficients, see Appendix, Tables A8.6–A8.8).

8.4.4 Robustness Checks

A series of robustness checks was carried out to test whether the gender-specific associations between local public childcare coverage and the time to attain career advancement after entering parenthood depended on methodological decisions.

First, we tested *alternative measures of career advancements*. The models were run with monthly and hourly wage gains of 10% and 30% and were then compared with the 20% threshold used in our main models (see Appendix, Figures A8.1 and A8.2). The alternative thresholds produced similar results for monthly wage gains. For hourly wage gains, the results showed that gender differences in the associations with childcare coverage tended to be smaller when higher thresholds were used. Additionally, absolute monthly wage gains of €500, €1,000 and €1,500 were analyzed, which overall revealed similar associations as the models predicting relative monthly wage gains (see Appendix, Figure A8.3).

Second, we tested the robustness of the results on monthly wage gains, hourly wage gains, and the attainment of leadership positions for *different sample restrictions*. The results were largely robust when using a reduced sample without self-employed individuals, when including only couple households across all models, when restricting the sample to observations before the Covid-19 pandemic, when restricting the sample to

parents living in West Germany, and when restricting the sample to individuals who had not attained a leadership position prior to entering parenthood (results available upon request). Restricting the sample to parents living in East Germany did not substantially change the results; however, the robustness of the estimates was reduced as a potential consequence of the small number of observations.

Third, we tested the robustness of our results based on the *selection of control variables*. We included the following individual controls in separate models: personal traits, whether parents actually used public childcare, whether parents used informal childcare (e.g., by grandparents), individuals' occupational field, and individuals' subsample membership. The associations with monthly wage gains, hourly wage gains, and the attainment of leadership positions were similar to those produced by the more parsimonious models (results available upon request).

Fourth, we tested our results on the moderating role of couples' division of labor by using different thresholds for male-breadwinner households. Specifically, we compared models in which households were classified as male-breadwinner if the male partner contributed more than 50%, 55%, or 60% to the household income prior to becoming parents (see Appendix, Figures A8.4–A8.6). The estimated coefficients revealed that the thresholds for male-breadwinner households did not substantially alter the interpretation of how the couples' division of labor moderated the gendered benefits of public childcare for career advancement.

8.5 Discussion

8.5.1 Discussion of Main Findings

This study has examined the relationship between local public childcare and the long-term career advancement of parents, extending previous research on the initial employment situation of mothers after childbirth (e.g., Brilli et al., 2016; Scherer & Pavolini, 2023; Zoch, 2020). Specifically, we focused on the extent to which the local public childcare coverage reduces the average time it takes mothers and fathers to advance in their careers, considering monthly wage gains, hourly wage gains, and the attainment of leadership positions. Moreover, we analyzed how the career benefits of local public childcare depend on the gendered division of labor within couples.

Overall, our study revealed that parents advanced in their career faster if they lived in a local context with higher public childcare coverage. This finding suggests that parents

make rational use of locally available childcare options (Steinberg & Kleinert, 2022), that their demand for public childcare is closely linked to their career prospects (Wood et al., 2023), and that the additional time and flexibility gained enable them to actively pursue their career advancement.

We also found that the local public childcare infrastructure is more relevant to mothers' than fathers' career advancement in terms of monthly wage gains and the attainment of leadership positions. These results demonstrate that the local public childcare infrastructure matters not only for mothers' initial employment situations (Brilli et al., 2016; Dujardin et al., 2018; Kalíšková & München, 2023; Zoch, 2020), but also for their long-term career trajectories. The results also supplement existing evidence on the earnings distribution of mothers and fathers five to six years after becoming parents (Chhaochharia et al., 2017; Krapf et al., 2021). Our predictions suggest that the career disadvantages for mothers who have insufficient public childcare in their local context continue to increase over time after the birth of their child. This leads to a significant cumulative disadvantage ten to fifteen years after childbirth.

Theoretically, the greater dependence of mothers' careers on public childcare can be explained by two perspectives. On the one hand, mothers often have lower income prospects, which provides a rational argument for economic considerations within the family regarding the division of labor (Becker, 1991). On the other hand, prevailing cultural norms and beliefs about gender may reinforce the expectation that mothers should be the primary caregivers (Hays, 1996; Lorber, 1994; Schmader & Block, 2025). These perspectives can both explain why local public childcare predominantly opens up career opportunities for mothers. Previous studies have shown that parents divide paid work more evenly when mothers have higher income prospects (Maes & Marynissen, 2024), but also that the majority of domestic work is still done by mothers (Syrda, 2023). This suggests that the gendered career benefits of public childcare result from a combination of family-economic decisions and gendered normative expectations.

After childbirth, many mothers return to work part-time, leading to increasingly different working hours for mothers and fathers, especially in Germany (Musick et al., 2020). Interestingly, our study found no significant gender differences in the benefits of local public childcare coverage on hourly wage gains. This suggests that, in local contexts with high public childcare coverage, mothers attain career advancements faster because they can work more hours. This explanation also aligns with well-established research showing

that public childcare contributes significantly to longer working hours for mothers (e.g., Boll & Lagemann, 2019; Zimmert, 2023; Zoch & Hondralis, 2017).

However, the results on hourly wage gains also suggest that mothers do not benefit significantly more than fathers from public childcare in terms of their job's pay level. At first glance, this may appear to contradict our gendered findings on leadership position attainment. However, it should be noted that working full-time (or at least long hours) is often necessary to attain a leadership position (Funk & Warning, 2025; Kleinert et al., 2007). Thus, higher earnings in leadership positions result, at least in part, from working significantly more hours. Additionally, attaining the first leadership position in a career may not always result in significantly higher hourly wages because individuals often cannot directly transfer their work experience from the previous position (Benson et al., 2019). Overall, our results emphasize the importance of considering career advancement in more than one dimension.

Reflecting diverging patterns in parents' gendered division of labor (Büchau et al., 2023), we argued that both mothers and fathers in dual-income households may benefit more from public childcare facilities than those in male-breadwinner households. Our results show that this tends to be the case for fathers, indicating that the impact of the local public childcare coverage on attaining career advancement was more noticeable when they were not in the role of the primary earner. This finding suggests that fathers represent a heterogeneous group (Gracia, 2014; Höfner et al., 2011) whose career trajectories are more sensitive to the local public childcare infrastructure when work (and potentially also care) tasks are divided more equally among partners. Based on our findings, fathers, on the other hand, advance in their careers regardless of public childcare coverage when the division of work is more traditional. This is largely consistent with research indicating a relationship between fathers' careers and their level of involvement in childcare (Bünning, 2020).

For mothers, living in a dual-earner household was not associated with higher benefits of public childcare, which stands in contrast to our expectations. Although it was theoretically assumed that mothers in dual-earner households would benefit more from public childcare due to their greater labor-market orientation, these mothers also face higher opportunity costs when leaving the labor market (Klesment & Van Bavel, 2016). They may organize childcare and their return to the labor market more in advance, making them less dependent on the public childcare infrastructure (Bian et al., 2024). Mothers

who contributed less to the household income may consider working more when public childcare is widely available, which makes career advancement easier. Therefore, our results regarding the division of labor suggest that the benefits of public childcare for mothers are not necessarily tied to traditional family roles. Rather, the results support the cost-benefit argument based on rational decision-making when using public childcare (Steinberg & Kleinert, 2022).

8.5.2 Limitations and Outlook

This study is not without limitations. First, by focusing on parents' career advancement, we are aware that we refer to a selected group of adults. Research has shown that individuals' economic stability often serves as a precondition for entering parenthood (Alderotti et al., 2021; van Wijk & Billari, 2024), which is why our results do not allow for a direct comparison with the career advancement of childless men and women. The primary goal of this study, however, was to compare chances for career advancement between different mothers and fathers. Nevertheless, it is necessary to reflect that patterns of parents' career advancement may be biased by selection mechanisms into parenthood (e.g., work experience and employment status), and we cannot fully guarantee that our controls for pre-parenthood employment characteristics captured all relevant factors.

Second, although GSOEP contains rich longitudinal data based on yearly panel surveys, it provides limited retrospective information on career trajectories before individuals participated in the survey. Additionally, career trajectories can only be estimated using yearly information, which leaves the exact timing of career events unknown. However, having used exact time information from the interviews (by year and month), we are confident that our estimates of career advancement events are sufficiently accurate.

Third, focusing on regional differences in public childcare coverage carries the risk of overlooking possible selection mechanisms and confounding variables. For this reason, our study does not make a causal claim for the observed associations. Moreover, although local public childcare coverage primarily reflects the infrastructure of the local context regarding public childcare, it may also be associated with other local characteristics, such as enterprises' family-friendliness, political attitudes, and cultural norms. Using regional controls (e.g., conservatism, share of large firms) minimizes the risk of unintended factors influencing the predictor variable. Furthermore, using local coverage rates instead of more individualized information (e.g., parents' actual use of public childcare) avoids larger

endogeneity problems that may arise because parents' decisions about using public childcare may be systematically biased by individual characteristics (Wood et al., 2023). However, including a measure of public childcare availability at a smaller regional scale than administrative districts (e.g., communities or neighborhoods) would have increased the informative value. Moreover, localized information on the actual capacity and parents' demands would have been more beneficial than using coverage rates for our estimation strategy. Unfortunately, no such data was available for Germany. Overall, while our measure likely provides conservative estimates, we cannot ultimately assess how accurately it captures the locally available public childcare infrastructure.

Fourth, it is important to note that there is no consensus on how to define career advancement or how to measure it. By comparing the results of different wage gain thresholds among parents, we concluded that the results depend more on the type of measure than on the specific cutoff. Our strategy was to capture different dimensions of career advancement to provide a more comprehensive picture of career trajectories.

Despite these limitations, our study has important policy implications. Our results imply that a well-developed public childcare infrastructure is important in reducing gender inequalities in parents' long-term career trajectories. These inequalities include the underrepresentation of women in leadership positions and higher-paid jobs. A crucial step would be to increase the overall supply of public childcare, paying particular attention to areas with low levels of coverage. As our study suggests, public childcare could also open up career opportunities for mothers in households with a more traditional division of labor. To ensure its effectiveness, public childcare must be available locally, affordable, and offer flexible hours that meet parents' needs (Meiner-Teubner et al., 2024). Another effective measure would be to reduce barriers in the application process (Hermes et al., 2024). As public childcare coverage is expected to further increase, it will be interesting to follow the distribution of parents' gendered career trajectories in the future.

C. GENERAL CONCLUSIONS

9. Discussion

In this dissertation, I have addressed the overarching research question of how differences in local contexts and individuals' dependence on them contribute to gender inequalities in career pathways. Based on my theoretical considerations and empirical research, the short answer is that local contexts are important for gender inequalities, in that they have distinctly gendered implications for different social groups and life stages. Along with the three empirical studies, I have provided deeper insights on this issue, examining adolescents' early career aspirations, higher education graduates' earnings in the first job, and parents' career advancement.

My first study asked to what extent the local occupational structure is related to gender inequalities in adolescents' aspirations for STEM careers. Compared to later life stages, adolescents are strongly bound to their surrounding context (Villanueva et al., 2012). By showing that the local prevalence of STEM occupations affects boys' early STEM career aspirations, the study suggests that local labor markets are not only relevant in the decision-making process during upcoming transitions (Flohr et al., 2020; Hartung et al., 2022; Malin & Jacob, 2018), but already in the formation of adolescents' occupational preferences and aspirations. This implies that local role models and cultural norms on occupations are relevant drivers of how occupational structures influence adolescents' early career aspirations. This broadly aligns with previous research, which has highlighted the role of local conservativeness (Kuhn & Wolter, 2023; Osikominu et al., 2020).

By revealing that girls' STEM career aspirations did not vary with local STEM prevalence, the first study points to the existence of culturally embedded gender-essentialist beliefs about STEM occupations being less compatible for girls (Thébaud & Charles, 2018), thus framing the impact of STEM-related local role models and norms in a gendered way. As the gender composition of STEM prevalence has been shown to vary only little across local contexts and also played no evident role for STEM career aspirations, gender-essentialist beliefs about desirable occupations appear as largely omnipresent to adolescents and rather independent of local labor markets—underscoring how deeply these beliefs are rooted in society (Charles, 2017; Charles & Grusky, 2005; Correll, 2001).

My second study looked at the extent to which higher education graduates' use of spatial mobility to overcome boundaries of the local context is associated with gender inequalities in earnings at the start of the career. The evident mobility benefits suggest that graduates are overall less dependent on their local context than adolescents for example. The groups which benefited by far the most through their local context decisions were male partnered graduates and female graduates without a partner. This implies that career-strategic mobility decisions can help certain groups of graduates overcome unfavorable local labor markets, in line with what previous research has suggested (Kopečný & Hillmert, 2021; K. Morris, 2025). Thus, the local context is important in providing opportunity structures, such as income structures, for graduates at their career start, and graduates can potentially decide whether they stay in the study region or opt for other, more promising local labor markets.

By showing that female graduates were especially dependent on their male partners' local context decisions—reflected in increased gender inequalities in earnings—my second study suggests that gendered divisions of roles in partnerships are salient for graduates. This can be related both to household economic considerations (Mincer, 1978) and to cultural beliefs about gender (Charles & Grusky, 2005; Ridgeway, 2009). Along with what is known about gendered mobility decisions among married and partnered individuals within their careers (R. Crane, 2007; Kley & Drobnič, 2019; McQuaid & Chen, 2012; Nisic, 2009; Nisic & Abraham, 2015; Rapino & Cooke, 2011), the study indicates that mobility decisions already influence gender inequalities at the start of a career, with the impact largely depending on graduates' partnership situation.

My third study addressed the question to what extent the local public childcare infrastructure can contribute to reduced gender inequalities in parents' career trajectories. Parents with small children are often restricted in their flexibility to move to other, more distant local contexts because of their family situation (Hofmann & Rüger, 2024), increasing their dependence on the context in which they live (Hillmert, 2008; Schindler & Neely, 2024). My study underscored that a high local public childcare coverage is an important local context characteristic that allows mothers to focus more on their careers, resulting not only in increased labor force participation as shown by previous research (Dujardin et al., 2018; Hofferth & Collins, 2000; Scherer & Pavolini, 2023; Zoch, 2020), but also in faster career advancement. As I observed this association largely regardless of parents' division of work, available local public childcare as an

opportunity structure may provide rational arguments for mothers to counteract traditional cultural beliefs and ideals about motherhood (Hays, 1996; Lorber, 1994; Walls et al., 2016).

My third study also showed that fathers, in contrast to mothers, were significantly less affected by locally available public childcare, highlighting its potential to reduce local context-dependent gender inequalities in career advancement. By indicating that fathers in dual-earner households tended to benefit as well, the study further implies that fathers' career trajectories were sensitive to the local public childcare infrastructure if they identified less with traditional cultural beliefs and ideals on fatherhood (Dermott, 2014; Höfner et al., 2011). Nevertheless, the limited role of locally available public childcare for fathers who are primary earners suggests that traditional beliefs about male breadwinners are still salient in society (Lewis, 1992; Pfau-Effinger, 1998). Altogether, my study suggests that locally available public childcare can mitigate gender inequalities, particularly among parents with traditional gendered beliefs, who typically follow the most unequal career pathways.

In comparing my three studies, a few commonalities of how local contexts shape gender inequalities in career pathways can be outlined. First, as I did not find a life-stage-specific scenario where local contexts were completely unimportant, my research suggests that gender inequalities in career pathways are shaped by local context conditions across various life stages. Thus, in line with the principle of life course research on the meaning of historical and contextual time (Elder, 1994), local contexts appear to matter across the life course, albeit in different forms and to varying degrees.

Second, individuals' dependence on local contexts is neither stable nor does it follow a linear pattern across life stages. As indicated, dependence may be lower during career transitions and for individuals less tied to the private family context, as is the case for higher education graduates without a partner or children (Krabel & Flöther, 2014). For the role of local contexts in gender inequalities, however, restricted mobility opportunities and strong ties to local contexts—typical for adolescents, partnered graduates, and parents—are particularly relevant.

Third, the studies give insights into relevant types of local context differences and how they appear as relevant for gender inequalities in career pathways. These types may often relate to labor market structures and conditions, as highlighted by the first two studies. Local labor markets can directly affect career pathways by for instance offering better job

opportunities for higher education graduates. However, in line with my first study's implications, structures of the local context can also shape occupational images by contagious expectations and norms (Kuhn & Wolter, 2023; Osikominu et al., 2020), or by allowing for increased contact with role models from certain prevalent occupations (Bell et al., 2019; Flohr et al., 2020). Besides local labor markets, local contexts can affect gendered career pathways via life-stage-specific relevant differences in other spheres, such as is the case with the availability of public childcare.

Fourth, the influence of local contexts is not universal but depends on how individuals perceive and act within those local contexts. This dissertation has highlighted adolescents' perceptions of occupational images, graduates' decisions about where to live, and the division of labor within partnerships. The idea that local context influences interact with individuals' perceptions and behaviors has already been emphasized by the social-ecological research approach regarding the socialization processes of children (Bronfenbrenner, 1979). It is also consistent with the concept of human agency, which highlights that individuals make their own choices within the tension between structural opportunities and constraints (Elder, 1994; Settersten, 2003). These perceptions and behaviors may be guided by individuals' rational considerations (Becker, 1991; Mincer, 1978; Polachek, 1981) but can also be framed by cultural beliefs and expectations about gender and gendered roles (Correll, 2004; Lorber, 1994; Ridgeway, 2009; Shauman & Noonan, 2007). In this way, local contexts play an important role in shaping individuals' gendered career pathways.

Fifth and last, the gendered impact of local contexts varies among different social groups. As assumed, there is considerable variance in the vulnerability of social groups, and my research implies that especially life stage-specific disadvantaged social subgroups—such as non-academically oriented boys, female graduates in partnerships, and mothers—are more dependent on and sensitive towards local contexts: Among adolescents, non-academically oriented boys appeared most affected by the local STEM prevalence, especially in structurally weak labor markets. The local context dependence of female partnered graduates was not expressed in a direct way but was implied indirectly via career disadvantages that occurred from context-dependent mobility decisions of their partners. And mothers' career trajectories were most dependent on the local public childcare infrastructure, not only but also largely in households with a traditional division of labor. Overall, these conclusions are in line with previous research on local context

effects on vulnerable groups in the school-to-work transition (Hartung et al., 2022; Hillmert et al., 2017; K. Morris, 2025; Weßling, 2016; Weßling et al., 2015).

Ultimately, my research demonstrates that the influence of local contexts cannot be summarized in a single story. Instead, dependencies on local contexts and their specific characteristics can shape gender inequalities in career pathways in multiple ways across the life course. Considering these multifaceted local context influences can help to generate a more comprehensive understanding of gender inequalities in career pathways.

10. Limitations

This dissertation has its limitations, which are discussed in the following. First of all, the three empirical studies could provide only specific spotlights on the broad research fields of gender inequalities in career pathways. This means that other relevant aspects of gendered career pathways remain unconsidered—for instance gendered study choices, which can be expected to vary with the local prevalence of higher education institutions (Denzler & Wolter, 2011; Frenette, 2006; Weßling & Bechler, 2019). Moreover, gendered pathways to retirement offer a promising research avenue, as the existing gender gap in pension entitlements may reflect the cumulative impact of local contextual factors shaping career trajectories over the life course (Abatemarco et al., 2023; Herold, 2025; Madero-Cabib et al., 2023). Therefore, my focus on adolescents' career aspirations, higher education graduates' career entries, and parents' career trajectories is merely illustrative and serves to highlight the complex and multifaceted ways in which local contexts can matter.

Furthermore, I have focused in this dissertation on supply-side explanations of gender inequalities to maintain conceptual consistency. Of course, demand-side aspects, such as gender-specific firm policies and discriminatory practices by employers (Bishu & Alkadry, 2017; Card et al., 2025; Minssen et al., 2024), are important issues as well and may also be shaped by local contexts, especially as firm structures largely differ at the regional level (Barbour & Markusen, 2007; Brixy & Grotz, 2007; Dustmann et al., 2014). To further develop our understanding of local context effects on gender inequalities in career pathways, demand-side perspectives may offer an insightful direction for future research.

Additionally, I consistently considered local contexts at the level of local administrative districts (NUTS-3). Relevant regional data—such as on public childcare coverage or STEM prevalence—were not available across Germany at a more granular geographic level. However, it should be noted that, depending on individual circumstances and life stage, the relevant local context may differ in its size and hence, individual socio-spatial boundaries are likely to differ from official boundaries of districts (Schindler & Neely, 2024; Villanueva et al., 2012; Weßling & Bechler, 2019). In addition, the size of German districts varies quite significantly, as district boundaries are partly the result of urban developments of the past (Kosfeld & Werner, 2012). Therefore, district boundaries serve as a rather broad proxy for individuals' relevant socio-spatial context, and future research should try to implement individuals' perceived socio-spatial boundaries to test whether the results are stable. Nevertheless, using regional data at the NUTS-3 level also has its advantages, as it contributes to the comparability and reproducibility of my research, both within this dissertation but also with regard to other regional studies on Germany or European countries.

The transferability of my findings to other country contexts represents an important issue, as my research has focused on Germany. Generally, it can be expected that structures of the local context are also relevant for gendered career pathways in other countries (Scherer & Pavolini, 2023). The peculiarities of the German education system, labor market structures, and public childcare policies may, however, require testing assumptions about the role of local contexts in other countries. As shown by Hägglund and Leuze (2021), country-specific labor market characteristics are related to gender gaps in STEM career aspirations. To test the country-specific role of local labor markets for gendered career aspirations, it would therefore be interesting to compare the results of my research with those of countries that have less stratified education and training systems, such as the Scandinavian countries or the UK (Gogescu, 2024). In addition, it would be interesting to analyze graduates' mobility benefits in countries with weaker and more concentrated graduate labor markets than in Germany, such as in many eastern and southern European countries (F. Green & Henseke, 2021). Given the significant differences in public childcare coverage rates and mothers' labor market prospects across countries and welfare regimes (European Commission/EACEA/Eurydice, 2025; Kleven et al., 2024), further comparative evidence comparing public childcare benefits for gendered career advancement would be informative (Scherer & Pavolini, 2023).

Finally, with the research conducted in this dissertation I cannot prove causality in the observed associations. This is especially true because of potential selection effects, implying that individuals may systematically self-select into certain local contexts (T. Morris et al., 2018). I have tried to account for relevant observable selection mechanisms based on theoretical assumptions and using advanced analytical strategies, however, I ultimately cannot rule out the possibility of omitted variable bias (Galster, 2008). Similarly, associations with local context characteristics may be biased by other regionally varying indicators. Regional indicators are often interrelated, which induces the potential risk of overcontrol bias (Dupont et al., 2022; Grätz, 2022). Therefore, a theoretically reasonable selection of regional controls was necessary to account for noticeable common causes. Additionally, stepwise modeling procedures and robustness checks on the selection of controls could help assess the stability of the results based on theoretical assumptions. After all, it appears reasonable to interpret the reported associations in a directional way. Nevertheless, it must be made clear that these interpretations of causality are based on theoretical assumptions that ultimately cannot be tested.

11. Implications and Outlook

Gender inequalities in career pathways have remained a prevalent issue across Western countries (F. D. Blau & Kahn, 2017; Charles & Grusky, 2005; Kleven et al., 2024). As expressed by the United Nations' Sustainable Development Goals, a global understanding of the importance of gender equality has been widely established, yet inequalities in career pathways persist (di Bella et al., 2023; Heß, 2020; United Nations, 2025b). In this dissertation, I have demonstrated that these inequalities are shaped by local contexts in multiple ways. This suggests that gender inequalities often overlap with regional inequalities. The findings of this dissertation have several implications for researchers and policymakers.

One important step is to identify inequalities between regions that matter for gendered career pathways, a task to which this dissertation can make a contribution. Based on my research, relevant aspects of regional inequalities encompass differences in prevalent occupations and industries, wage levels of prevalent jobs, and the availability of public childcare infrastructure. When interested in promoting gender equality, strategies need to be developed to reduce these regional inequalities by strengthening the relevant

opportunity structure in disadvantaged local contexts. Monitoring the development within and between local contexts is essential to assess whether applied policies effectively reduce regional inequalities or whether regional divides persist.

Offering the right opportunity structures gives individuals the possibility to make rational use of them. Therefore, a further necessary and straightforward approach would be to address individuals in the formation of their career pathways by disclosing information on opportunities and constraints in their local context, such as in career counseling programs. Importantly, to ultimately address gender inequalities, individual counselling approaches need to be gender-specific and should strengthen the female career perspective in potential decisions and behaviors. Therefore, they would need to critically reflect on gender-biased self-perceptions and behaviors in social relations, contributing to a greater awareness of gender-specific career consequences. Based on this knowledge, individuals, couples, and families may not only be better informed about opportunities within and beyond perceived boundaries of their local context but also consider career-related decisions and behaviors that are beneficial for both men and women.

However, gender inequalities in career pathways are not only based on individuals and their social relations but also on structural and institutionalized rules (Risman, 2004). My research suggests that gender as a social structure is reflected in the role of local contexts, reinforcing gender-specific ways in which local contexts and their peculiarities shape career pathways. In other words, cultural beliefs about gender frame individuals' perceptions and use of existing local structures (Ridgeway, 2009; Ridgeway & Correll, 2004). These cultural beliefs can encompass both gender-essentialist views on existing differences between men's and women's interests and competences (e.g., reflected in gendered career aspirations and couples' division of labor) and beliefs regarding the primacy of men for higher-status positions (e.g., reflected in gender-specific attainment of well-paid jobs and leadership roles) (Charles & Grusky, 2005; Ridgeway, 2001).

Cultural beliefs about gender may be contagious and differ between local contexts, although I have not been able to find evidence for this in the context of this dissertation – underlining the generalizability of gender as an institutionalized social structure across local contexts (Ridgeway, 2009; Risman, 2004). However, cultural beliefs, as stable as they appear, can be subject to change. This change can be addressed and supported by targeted policy interventions and educational programs that build an understanding of the importance of gender equality, questioning for instance the maintenance of gendered

occupational fields, the traditional division of labor in partnerships, and men's dominance in leadership positions. This may be a relatively slow process and ultimately relies on public approval by society. However, it can be assumed that addressing gender inequalities at the individual level will not be sufficient, but that a cultural change in society's understanding of gender-related injustices is needed as well. Following Risman (2009), this could lead to a shift from "doing gender" to "undoing gender", causing gender to slowly fade into the background as a career-relevant category. As emphasized at the very beginning of this dissertation, this may ultimately also contribute to a more "peaceful, prosperous, and sustainable world" (United Nations, 2025a).

To support this process, career-related gender inequalities must continue to be systematically identified and articulated by researchers in the future. In fact, our understanding of the multifaceted role of local contexts in the emergence of gender inequalities in career pathways may have just begun. It will be important to analyze the role of changing structures in the local context over time and their implications for gender inequalities. Moreover, my research suggests that a deeper understanding of how gendered perceptions of socio-spatial boundaries and dependencies on the local context change throughout life will be relevant, which requires further comparative life course studies. Ultimately, my dissertation may help to lay a foundation for future research on the entanglement of regional and gender inequalities.

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Appendix

Supplementary Materials for Study 1

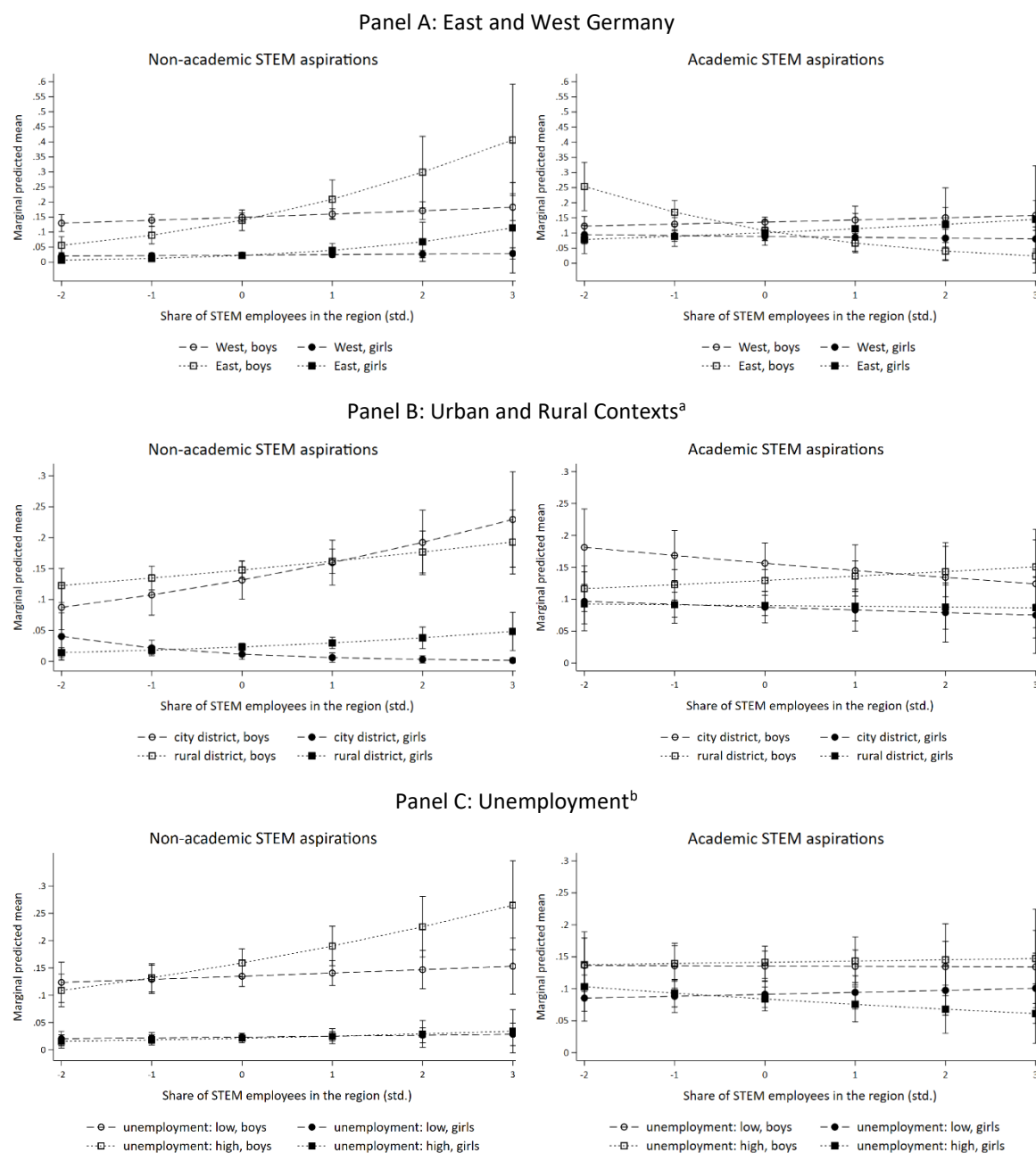


Figure A6.1. Heterogeneity Analyses: Predictive Means of Boys' and Girls' STEM Aspirations by the Share of STEM Employees for Local Labor Markets in East/West Germany, Urban and Rural Contexts, and Contexts With Above- and Below-Average Unemployment Rates.

Note. Regional and individual controls included. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency. BBSR – INKAR Database. 20 Imputations.

^a Binary differentiation between cities without an associated county (*kreisfreie Städte* and *Stadtkreise*) and country districts (*Landkreise*). ^b Binary differentiation between local labor markets with an unemployment rate below and above the median.

Table A6.1. Overview on Sample Restrictions.

Exclusion criteria	Deleted cases	New sample size
Students from special-needs schools	390	6,328
Students without valid living place information	617	5,711
Students without information on occupational aspirations	559	5,152

Note. Data source: NEPS-SC3 13-0-0.

Table A6.2. Average Marginal Effects (AMEs) of STEM Employees Predicting Idealistic Non-Academic, Academic, and Highly Qualified Non-Academic STEM Aspirations by Gender.

	Non-Academic STEM Aspirations				Academic STEM Aspirations				Highly Qualified Non-Academic STEM Aspirations			
	Boys		Girls		Boys		Girls		Boys		Girls	
Share of STEM employees	0.02***	[0.01]	0.00	[0.00]	0.00	[0.01]	-0.00	[0.01]	0.00	[0.01]	-0.00	[0.00]
<i>Regional controls:</i>												
East Germany (ref. West)	-0.03	[0.02]	0.00	[0.01]	0.02	[0.02]	0.02	[0.02]	-0.01	[0.02]	0.00	[0.00]
Population density	-0.01	[0.01]	0.00	[0.00]	0.00	[0.01]	0.00	[0.01]	0.02	[0.01]	0.00	[0.00]
Unemployment rate	0.03*	[0.01]	0.00	[0.00]	-0.02+	[0.01]	-0.01	[0.01]	0.01	[0.01]	-0.00	[0.00]
Conservativeness	0.02	[0.01]	0.01**	[0.00]	-0.01	[0.01]	-0.01	[0.01]	0.02	[0.01]	-0.00	[0.00]
<i>Individual controls:</i>												
Math grades	0.01	[0.01]	0.01+	[0.00]	0.01	[0.01]	0.01*	[0.01]	0.02*	[0.01]	-0.00	[0.00]
Intermediate school track (ref. low)	-0.04	[0.03]	-0.01	[0.01]	0.02	[0.02]	0.02	[0.02]	0.01	[0.02]	-0.00	[0.00]
High school track (ref. low)	-0.14***	[0.03]	-0.03**	[0.01]	0.03*	[0.01]	0.08***	[0.02]	0.06**	[0.02]	0.01	[0.01]
Extraversion	0.00	[0.01]	0.00	[0.00]	-0.01	[0.01]	0.02*	[0.01]	0.03***	[0.01]	-0.00	[0.00]
Agreeableness	0.00	[0.01]	0.00	[0.00]	0.00	[0.01]	-0.01*	[0.01]	-0.01	[0.01]	-0.00	[0.00]
Conscientiousness	-0.01	[0.01]	-0.00	[0.00]	-0.01	[0.01]	0.01	[0.01]	0.00	[0.01]	-0.00	[0.00]
Neuroticism	-0.00	[0.01]	-0.00	[0.00]	0.00	[0.01]	-0.00	[0.01]	0.00	[0.01]	-0.00	[0.00]
Openness to experience	-0.02*	[0.01]	-0.00	[0.00]	-0.01+	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.00+	[0.00]
Migration background	-0.03+	[0.01]	-0.02*	[0.01]	-0.00	[0.01]	0.01	[0.01]	0.02	[0.01]	0.00	[0.00]
Parent working in STEM	0.01	[0.02]	0.01	[0.01]	-0.01	[0.02]	0.01	[0.02]	0.04*	[0.02]	0.00	[0.01]
Parents' SES	-0.02*	[0.01]	-0.00	[0.00]	-0.01	[0.01]	-0.00	[0.01]	0.01	[0.01]	0.00	[0.00]
<i>N</i>	2,543		2,609		2,543		2,609		2,543		2,609	

Note. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency. BBSR – INKAR Database. 20 Imputations.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A6.3. Average Marginal Effects (AMEs) of Female STEM Employees Predicting Idealistic Non-Academic, Academic, and Highly Qualified Non-Academic STEM Aspirations by Gender.

	Non-Academic STEM Aspirations				Academic STEM Aspirations				Highly Qualified Non-Academic STEM Aspirations			
	Boys		Girls		Boys		Girls		Boys		Girls	
Share of Female STEM employees	-0.01	[0.01]	-0.00	[0.00]	-0.00	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.00	[0.00]
<i>Regional controls:</i>												
East Germany (ref. West)	-0.02	[0.03]	0.01	[0.01]	0.03 ⁺	[0.02]	0.03	[0.02]	-0.00	[0.03]	0.00	[0.01]
Population density	-0.01	[0.01]	0.01 ⁺	[0.00]	0.00	[0.01]	0.00	[0.01]	0.02	[0.01]	0.00	[0.00]
Unemployment rate	0.02 ⁺	[0.01]	0.00	[0.00]	-0.02 [*]	[0.01]	-0.02 ⁺	[0.01]	0.01	[0.01]	-0.00	[0.00]
Conservativeness	0.02	[0.01]	0.01 [*]	[0.00]	-0.01	[0.01]	-0.01	[0.01]	0.02	[0.01]	-0.00	[0.00]
<i>Individual controls:</i>												
Math grades	0.01	[0.01]	0.01 ⁺	[0.00]	0.01	[0.01]	0.01 [*]	[0.01]	0.02 [*]	[0.01]	-0.00	[0.00]
Intermediate school track (ref. low)	-0.05	[0.03]	-0.01	[0.01]	0.02	[0.02]	0.02	[0.02]	0.01	[0.02]	-0.00	[0.00]
High school track (ref. low)	-0.14 ^{***}	[0.03]	-0.03 ^{**}	[0.01]	0.03 [*]	[0.01]	0.08 ^{***}	[0.02]	0.06 [*]	[0.02]	0.01	[0.01]
Extraversion	0.00	[0.01]	0.00	[0.00]	-0.01	[0.01]	0.02 [*]	[0.01]	0.03 ^{***}	[0.01]	-0.00	[0.00]
Agreeableness	0.00	[0.01]	-0.00	[0.00]	0.00	[0.01]	-0.01 [*]	[0.01]	-0.01	[0.01]	-0.00	[0.00]
Conscientiousness	-0.01	[0.01]	-0.00	[0.00]	-0.01	[0.00]	0.01	[0.01]	0.00	[0.01]	-0.00	[0.00]
Neuroticism	-0.00	[0.01]	0.00	[0.00]	0.00	[0.01]	-0.00	[0.01]	0.00	[0.01]	-0.00	[0.00]
Openness to experience	-0.02 [*]	[0.01]	-0.00	[0.00]	-0.01 ⁺	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.00 ⁺	[0.00]
Migration background	-0.02 ⁺	[0.01]	-0.02 [*]	[0.01]	-0.00	[0.01]	0.01	[0.01]	0.02	[0.01]	0.00	[0.00]
Parent working in STEM	0.01	[0.02]	0.01	[0.01]	-0.01	[0.02]	0.00	[0.02]	0.05 [*]	[0.02]	-0.00	[0.01]
Parents' SES	-0.02 [*]	[0.01]	-0.00	[0.00]	-0.00	[0.01]	0.00	[0.01]	0.01	[0.01]	0.00	[0.00]
<i>N</i>	2,543		2,609		2,543		2,609		2,543		2,609	

Note. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency. BBSR – INKAR Database. 20 Imputations.

⁺ $p < .10$, ^{*} $p < .05$, ^{**} $p < .01$, ^{***} $p < .001$.

Table A6.4. Average Marginal Effects (AMEs) of STEM Employees Predicting Idealistic STEM Aspirations for Boys and Girls.

	Boys' Idealistic STEM Aspirations			Girls' Idealistic STEM Aspirations		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Share of STEM employees	0.02* [0.01]	0.02* [0.01]	0.02* [0.01]	0.00 [0.01]	-0.00 [0.01]	-0.00 [0.01]
<i>Regional controls:</i>						
East Germany (ref. West)		-0.00 [0.03]	-0.01 [0.03]		0.02 [0.02]	0.02 [0.02]
Population density		0.01 [0.01]	0.01 [0.01]		0.00 [0.01]	0.01 [0.01]
Unemployment rate		0.03+ [0.02]	0.02 [0.02]		-0.02+ [0.01]	-0.01 [0.01]
Conservativeness		0.03+ [0.02]	0.02 [0.02]		-0.00 [0.01]	0.01 [0.01]
<i>Individual controls:</i>						
Math grades			0.03** [0.01]			0.02* [0.01]
Intermediate school track (ref. low)			-0.01 [0.03]			0.02 [0.02]
High school track (ref. low)			-0.05+ [0.03]			0.06* [0.02]
Extraversion			0.02* [0.01]			0.02* [0.01]
Agreeableness			-0.01 [0.01]			-0.02* [0.01]
Conscientiousness			-0.01 [0.01]			0.01 [0.01]
Neuroticism			0.00 [0.01]			-0.01 [0.01]
Openness to experience			-0.04*** [0.01]			-0.01+ [0.01]
Migration background			-0.01 [0.02]			-0.01 [0.02]
Parent working in STEM			0.05+ [0.03]			0.01 [0.02]
Parents' SES			-0.01 [0.01]			-0.00 [0.01]
<i>N</i>	2,543	2,543	2,543	2,609	2,609	2,609

Note. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency. BBSR – INKAR Database. 20 Imputations.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A6.5. Average Marginal Effects (AMEs) of Female STEM Employees Predicting Idealistic STEM Aspirations for Boys and Girls.

	Boys' Idealistic STEM Aspirations			Girls' Idealistic STEM Aspirations		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Share of female STEM employees	-0.02* [0.01]	-0.02* [0.01]	-0.02* [0.01]	-0.00 [0.01]	-0.01 [0.01]	-0.01* [0.01]
<i>Regional controls:</i>						
East Germany (ref. West)		0.02 [0.03]	0.01 [0.03]		0.03 [0.02]	0.03 [0.02]
Population density		0.01 [0.01]	0.01 [0.01]		0.01 [0.01]	0.01 [0.01]
Unemployment rate		0.01 [0.02]	0.01 [0.02]		-0.02* [0.01]	-0.02 [0.01]
Conservativeness		0.03 [0.02]	0.02 [0.02]		-0.01 [0.01]	0.00 [0.01]
<i>Individual controls:</i>						
Math grades			0.03** [0.01]			0.02* [0.01]
Intermediate school track (ref. low)			-0.01 [0.03]			0.02 [0.02]
High school track (ref. low)			-0.05 [0.03]			0.06* [0.02]
Extraversion			0.02* [0.01]			0.02* [0.01]
Agreeableness			-0.01 [0.01]			-0.02* [0.01]
Conscientiousness			-0.01 [0.01]			0.01 [0.01]
Neuroticism			0.00 [0.01]			-0.01 [0.01]
Openness to experience			-0.04*** [0.01]			-0.01* [0.01]
Migration background			-0.00 [0.02]			-0.01 [0.02]
Parent working in STEM			0.05+ [0.03]			0.01 [0.02]
Parents' SES			-0.01 [0.01]			0.00 [0.01]
<i>N</i>	2,543	2,543	2,543	2,609	2,609	2,609

Note. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency. BBSR – INKAR Database. 20 Imputations.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A6.6. Average Marginal Effects (AMEs) of STEM Employees Predicting Realistic STEM Aspirations for Boys and Girls.

	Boys' Realistic STEM Aspirations			Girls' Realistic STEM Aspirations		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Share of STEM employees	0.03* [0.01]	0.03* [0.01]	0.02* [0.01]	0.00 [0.01]	-0.00 [0.01]	-0.00 [0.01]
<i>Regional controls:</i>						
East Germany (ref. West)		-0.01 [0.03]	-0.02 [0.03]		0.01 [0.02]	0.00 [0.02]
Population density		0.01 [0.01]	0.02* [0.01]		0.01 [0.01]	0.01 [0.01]
Unemployment rate		0.01 [0.02]	0.01 [0.02]		-0.01 [0.01]	-0.00 [0.01]
Conservativeness		0.02 [0.02]	0.02 [0.02]		0.01 [0.01]	0.01 [0.01]
<i>Individual controls:</i>						
Math grades			0.05*** [0.01]			0.01* [0.01]
Intermediate school track (ref. low)			0.00 [0.03]			0.01 [0.02]
High school track (ref. low)			-0.03 [0.03]			0.04* [0.02]
Extraversion			0.01 [0.01]			0.01* [0.01]
Agreeableness			-0.01 [0.01]			-0.00 [0.01]
Conscientiousness			-0.02* [0.01]			0.00 [0.01]
Neuroticism			0.01 [0.01]			-0.00 [0.01]
Openness to experience			-0.03** [0.01]			-0.00 [0.01]
Migration background			-0.03 [0.02]			-0.00 [0.01]
Parent working in STEM			0.06* [0.03]			0.02 [0.02]
Parents' SES			-0.03* [0.01]			0.00 [0.01]
<i>N</i>	2,543	2,543	2,543	2,609	2,609	2,609

Note. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency. BBSR – INKAR Database. 20 Imputations.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A6.7. Average Marginal Effects (AMEs) of Female STEM Employees Predicting Realistic STEM Aspirations for Boys and Girls.

	Boys' Realistic STEM Aspirations						Girls' Realistic STEM Aspirations					
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Share of female STEM employees	-0.02 ⁺ [0.01]	-0.02 [0.01]	-0.01 [0.01]	-0.01 [0.01]	-0.01 [0.01]	-0.01 [0.01]	-0.01 [0.01]	-0.01 [0.01]	-0.01 [0.01]	-0.01 [0.01]	-0.01 [0.01]	-0.01 [0.01]
<i>Regional controls:</i>												
East Germany (ref. West)		0.00 [0.04]	-0.01 [0.04]					0.01 [0.02]	0.01 [0.02]			
Population density		0.02 [*] [0.01]	0.02 [*] [0.01]					0.01 [0.01]	0.01 [0.01]			
Unemployment rate		0.00 [0.02]	-0.00 [0.02]					-0.01 [0.01]	-0.01 [0.01]			
Conservativeness		0.02 [0.02]	0.02 [0.02]					0.00 [0.01]	0.01 [0.01]			
<i>Individual controls:</i>												
Math grades			0.05 ^{***} [0.01]						0.01 [*] [0.01]			
Intermediate school track (ref. low)			-0.00 [0.03]						0.01 [0.02]			
High school track (ref. low)			-0.03 [0.03]						0.04 ⁺ [0.02]			
Extraversion			0.01 [0.01]						0.01 [*] [0.01]			
Agreeableness			-0.01 [0.01]						-0.00 [0.01]			
Conscientiousness			-0.02 ⁺ [0.01]						0.00 [0.01]			
Neuroticism			0.01 [0.01]						-0.00 [0.01]			
Openness to experience			-0.03 ^{**} [0.01]						-0.00 [0.01]			
Migration background			-0.03 [0.02]						-0.00 [0.01]			
Parent working in STEM			0.06 [*] [0.03]						0.02 [0.02]			
Parents' SES			-0.03 [*] [0.01]						0.00 [0.01]			
<i>N</i>	2,543	2,543	2,543	2,609	2,609	2,609						

Note. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency. BBSR – INKAR Database. 20 Imputations.

⁺ $p < .10$, ^{*} $p < .05$, ^{**} $p < .01$, ^{***} $p < .001$.

Table A6.8. Average Marginal Effects (AMEs) of STEM Employees and Female STEM Employees Predicting Boys' Idealistic Non-Academic STEM Aspirations, Including Additional Regional Controls.

Boys' Idealistic Non-Academic STEM Aspirations												
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Share of STEM employees	0.02**	[0.01]	0.02**	[0.01]	0.02**	[0.01]	0.02**	[0.01]	0.02*	[0.01]	0.02***	[0.01]
Female share of STEM employees	-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]
<i>Regional controls:</i>												
East Germany (ref. West)	-0.02	[0.03]	-0.02	[0.02]	-0.02	[0.03]	-0.03	[0.03]	-0.02	[0.03]	-0.05+	[0.03]
Population density	-0.01	[0.01]	-0.01	[0.02]	-0.01	[0.01]	-0.01	[0.02]	-0.02	[0.01]	-0.01	[0.01]
Unemployment rate	0.02*	[0.01]	0.03*	[0.01]	0.02*	[0.01]	0.02*	[0.01]	0.02*	[0.01]	0.02*	[0.01]
Conservativeness	0.01	[0.01]	0.01	[0.01]	0.01	[0.01]	0.01	[0.01]	0.01	[0.01]	0.01	[0.01]
<i>Individual controls:</i>												
Math grades	0.01	[0.01]	0.01	[0.01]	0.01	[0.01]	0.01	[0.01]	0.01	[0.01]	0.01	[0.01]
Intermediate school track (ref. low)	-0.04	[0.03]	-0.04	[0.03]	-0.04	[0.03]	-0.04	[0.03]	-0.04	[0.03]	-0.05	[0.03]
High school track (ref. low)	-0.14***	[0.03]	-0.14***	[0.03]	-0.14***	[0.03]	-0.14***	[0.03]	-0.14***	[0.03]	-0.14***	[0.03]
Extraversion	0.00	[0.01]	0.00	[0.01]	0.00	[0.01]	0.00	[0.01]	0.00	[0.01]	0.00	[0.01]
Agreeableness	0.00	[0.01]	0.00	[0.01]	0.00	[0.01]	0.00	[0.01]	0.00	[0.01]	-0.00	[0.01]
Conscientiousness	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]
Neuroticism	-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]
Openness to experience	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]
Migration background	-0.03+	[0.01]	-0.03+	[0.01]	-0.03+	[0.01]	-0.03+	[0.01]	-0.03+	[0.01]	-0.03+	[0.01]
Parent working in STEM	0.01	[0.02]	0.01	[0.02]	0.01	[0.02]	0.01	[0.02]	0.01	[0.02]	0.01	[0.02]
Parents' SES	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]
<i>Additional regional controls:</i>												
Share of large companies			-0.00	[0.01]								
Share of filled apprenticeship positions					0.00	[0.01]						
Total gross value added							-0.01	[0.01]				
Gross value added of the secondary sector									0.01	[0.01]		
Share of unskilled workers											-0.02	[0.01]
N	2543		2543		2543		2543		2543		2543	

Note. Cluster-robust standard errors in brackets. Data sources: NEPS-SC3 13-0-0; Federal Employment Agency. BBSR – INKAR Database. 20 Imputations.

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Appendix

Supplementary Materials for Study 2

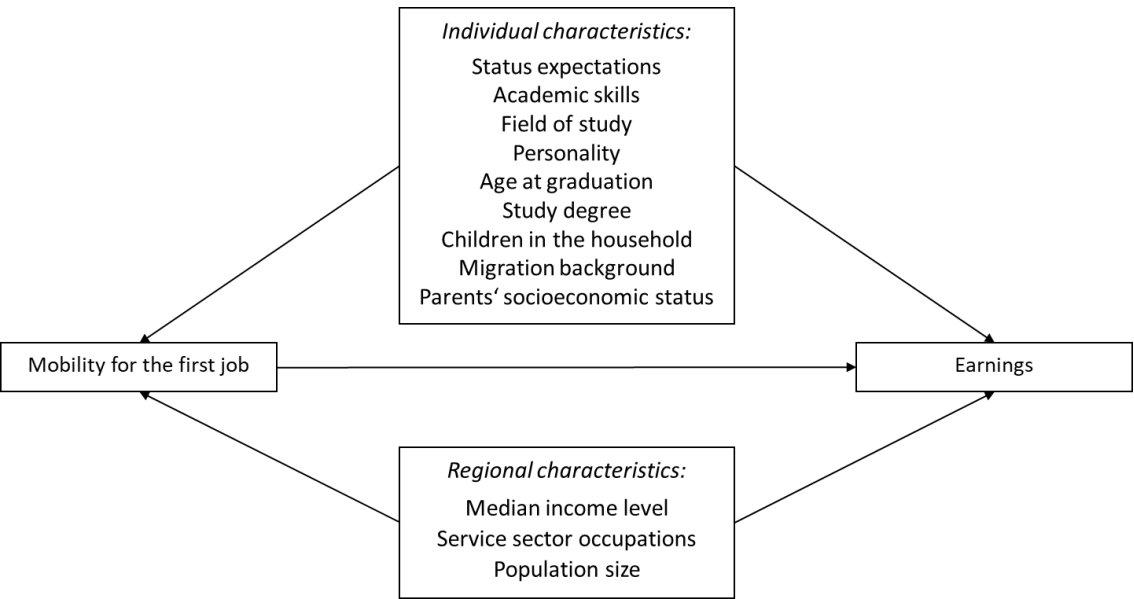


Figure A7.1. Theoretical Model of the Effect of Mobility for the First Job on Earnings.

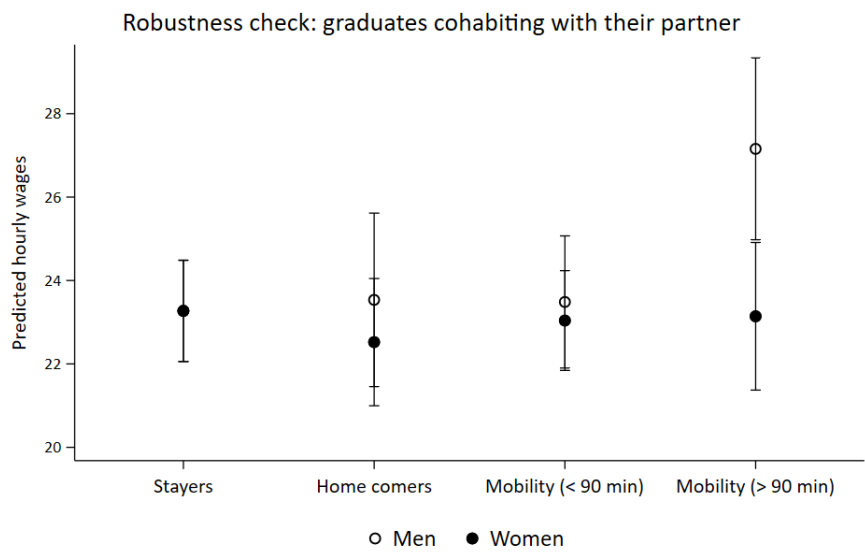


Figure A7.2. Predicted Hourly Wages by Mobility and Gender for Graduates Cohabiting With Their Partner, Including Additional Information on Partners’ Educational Background, Employment, and Age Difference.

Note. Entropy balancing weights and control variables included. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

Table A7.1. Selection Criteria and Sample Reductions.

Selection criteria	Deleted cases	New sample size
No secondary school episode starting in 2010 or later	23	17886
School-leaving certificate obtained inside Germany	407	17479
Age under 25 at the start of studies	1768	15711
Completion of higher education in 2012 at the earliest	2413	13298
Identifiable institution- and subject-specific higher education ID	252	13046
Information available on a regular employment episode	4671	8375
No student assistant jobs	735	7640
Employment consisted of more than 10 working hours per week	577	7063
The monthly income was above 450 Euro	245	6818
Employment started at maximum three months before or within the first two years after graduation	1675	5143
Employment lasted for more than three months	341	4802
Not cohabiting with a same-sex partner	61	4741
Available district information on school, study and work locations	71	4670

Note. Data source: NEPS-SC5 17-0-0.

Table A7.2. Overview of the Number of Complete and Imputed Information.

	<i>N</i> (complete)	<i>N</i> (imputed)	<i>N</i> (total)
Final grade	3822	848	4670
Status expectations	4045	625	4670
Hourly wage	4101	569	4670
Monthly earnings	4116	554	4670
Extraversion	4145	525	4670
Agreeableness	4145	525	4670
Conscientiousness	4147	523	4670
Neuroticism	4147	523	4670
Openness to experience	4147	523	4670
Parents' socioeconomic background	4392	278	4670
Children in the household	4442	228	4670
Actual working hours	4650	20	4670
Cohabiting with a partner	4660	10	4670
Field of study	4669	1	4670

Note. Data source: NEPS-SC5 17-0-0.

Table A7.3. Means in Treatment and Control Groups Before and After Applying Entropy Balancing Weights for Female Graduates.

	Women – Unbalanced distribution				Women – Balanced distribution			
	Stayers	Home-comers	Short-distance mobility	Long-distance mobility	Stayers	Home-comers	Short-distance mobility	Long-distance mobility
Status expectations (std.)	0.01	-0.02	0.04	0.02	0.02	0.02	0.02	0.02
Final grade (std.)	0.01	-0.04	-0.02	0.07	0.01	0.01	0.01	0.01
Field of study:								
Arts and humanities (ref.)	0.26	0.19	0.21	0.27	0.23	0.23	0.23	0.23
Economics	0.15	0.14	0.15	0.18	0.15	0.15	0.15	0.15
Sciences	0.25	0.20	0.24	0.28	0.25	0.25	0.25	0.25
Teaching	0.35	0.48	0.41	0.28	0.37	0.37	0.37	0.37
Personality:								
Extraversion (std.)	0.09	0.10	0.03	0.03	0.06	0.06	0.06	0.06
Agreeableness (std.)	0.10	0.23	0.21	0.13	0.15	0.15	0.15	0.15
Conscientiousness (std.)	0.19	0.27	0.21	0.14	0.20	0.20	0.20	0.20
Neuroticism (std.)	0.23	0.23	0.27	0.24	0.24	0.24	0.24	0.24
Openness to experience (std.)	0.17	0.17	0.09	0.16	0.15	0.15	0.15	0.15
Age at graduation (std.)	-0.17	-0.25	-0.22	-0.07	-0.17	-0.17	-0.17	-0.17
Study degree:								
No degree (ref.)	0.05	0.04	0.04	0.03	0.04	0.04	0.04	0.04
BA or equivalent	0.47	0.53	0.50	0.37	0.47	0.47	0.47	0.47
MA or equivalent	0.48	0.43	0.47	0.60	0.49	0.49	0.49	0.49
Cohabiting with a partner	0.50	0.45	0.46	0.32	0.44	0.44	0.44	0.44
Children in the household (ref. no children)	0.05	0.03	0.03	0.02	0.03	0.03	0.03	0.03
Migration background (ref. no migration background)	0.11	0.11	0.08	0.12	0.10	0.10	0.10	0.10
Parents' socio-economic background (std.)	-0.06	0.04	-0.07	0.04	-0.03	-0.03	-0.03	-0.03
Teacher over-sampling (ref.: no)	0.17	0.22	0.21	0.12	0.18	0.18	0.18	0.18
<i>N</i>	1,027	483	724	623	1,027	483	724	623

Note. Data source: NEPS-SC5 17-0-0. 20 imputations.

Table A7.4. Means in Treatment and Control Groups Before and After Applying Entropy Balancing Weights for Male Graduates.

	Men – Unbalanced distribution				Men – Balanced distribution			
	Stayers	Home-comers	Short-distance mobility	Long-distance mobility	Stayers	Home-comers	Short-distance mobility	Long-distance mobility
Status expectations (std.)	-0.01	-0.03	-0.04	-0.04	-0.03	-0.03	-0.03	-0.03
Final grade (std.)	0.07	-0.13	-0.10	0.02	-0.01	-0.01	-0.01	-0.01
Field of study:								
Arts and humanities (ref.)	0.09	0.07	0.05	0.09	0.08	0.08	0.08	0.08
Economics	0.18	0.20	0.20	0.28	0.21	0.21	0.21	0.21
Sciences	0.57	0.50	0.59	0.48	0.54	0.54	0.54	0.54
Teaching	0.16	0.23	0.17	0.15	0.17	0.17	0.17	0.17
Personality:								
Extraversion (std.)	-0.08	-0.07	-0.18	-0.06	-0.10	-0.10	-0.10	-0.10
Agreeableness (std.)	-0.24	-0.21	-0.25	-0.26	-0.24	-0.24	-0.24	-0.24
Conscientiousness (std.)	-0.25	-0.35	-0.40	-0.28	-0.31	-0.31	-0.31	-0.31
Neuroticism (std.)	-0.39	-0.31	-0.36	-0.44	-0.38	-0.38	-0.38	-0.38
Openness to experience (std.)	-0.22	-0.26	-0.30	-0.15	-0.23	-0.23	-0.23	-0.23
Age at graduation (std.)	0.33	0.18	0.25	0.28	0.28	0.28	0.28	0.28
Study degree:								
No degree (ref.)	0.03	0.08	0.04	0.06	0.05	0.05	0.05	0.05
BA or equivalent	0.33	0.39	0.39	0.26	0.34	0.34	0.34	0.34
MA or equivalent	0.64	0.53	0.58	0.68	0.62	0.62	0.62	0.62
Cohabiting with a partner	0.42	0.32	0.39	0.34	0.38	0.38	0.38	0.38
Children in the household (ref. no children)	0.05	0.04	0.04	0.02	0.04	0.04	0.04	0.04
Migration background (ref. no migration background)	0.15	0.12	0.11	0.12	0.13	0.13	0.13	0.13
Parents' socio-economic background (std.)	0.08	-0.01	-0.08	0.14	0.04	0.04	0.04	0.04
Actual working hours (std.)	0.08	0.13	0.08	0.09	0.09	0.09	0.09	0.09
Teacher over-sampling (ref.: no)	-0.01	-0.03	-0.04	-0.04	-0.03	-0.03	-0.03	-0.03
<i>N</i>	658	302	437	416	658	302	437	416

Note. Data source: NEPS-SC5 17-0-0. 20 Imputations.

Table A7.5. Robustness Check: Regression of Log. Hourly Wages on Mobility After Graduation by Gender, Without Using Entropy Balancing Weights.

	Women				Men			
	Model 2		Model 3		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>								
Home-comers	-0.01	[0.02]	-0.00	[0.03]	0.03	[0.03]	0.03	[0.03]
Short-distance mobility	0.06**	[0.02]	0.12***	[0.03]	0.03	[0.03]	0.04	[0.03]
Long-distance mobility	0.02	[0.02]	0.04	[0.03]	0.07**	[0.03]	0.03	[0.03]
<i>Partnerships (ref. living alone):</i>								
Cohabiting with a partner	0.01	[0.02]	0.04	[0.03]	-0.00	[0.02]	-0.03	[0.03]
<i>Interaction between mobility and cohabiting with a partner:</i>								
Home-comers # Cohabiting with a partner			-0.00	[0.05]			-0.00	[0.06]
Short-distance mobility # Cohabiting with a partner			-0.11**	[0.04]			-0.01	[0.05]
Long-distance mobility # Cohabiting with a partner			-0.03	[0.05]			0.12*	[0.05]
<i>Individual controls</i>								
Status expectations (std.)	0.05***	[0.01]	0.04***	[0.01]	0.04***	[0.01]	0.04***	[0.01]
Final grade (std.)	0.02*	[0.01]	0.02*	[0.01]	0.04**	[0.01]	0.04**	[0.01]
Field of study (ref. arts and humanities):								
Economics	0.11***	[0.03]	0.11***	[0.03]	0.21***	[0.04]	0.21***	[0.04]
Sciences	0.16***	[0.02]	0.16***	[0.02]	0.25***	[0.04]	0.25***	[0.04]
Teaching	0.17***	[0.03]	0.17***	[0.03]	0.22***	[0.05]	0.22***	[0.05]
Personality (Big 5)								
Extraversion (std.)	0.01	[0.01]	0.01	[0.01]	0.02*	[0.01]	0.02*	[0.01]
Agreeableness (std.)	-0.00	[0.01]	-0.00	[0.01]	0.00	[0.01]	0.00	[0.01]
Conscientiousness (std.)	0.01	[0.01]	0.01	[0.01]	0.03**	[0.01]	0.03**	[0.01]
Neuroticism (std.)	-0.00	[0.01]	-0.00	[0.01]	0.00	[0.01]	0.00	[0.01]
Openness to experience (std.)	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]
Age at graduation (std.)	0.04***	[0.01]	0.03***	[0.01]	0.05***	[0.01]	0.05***	[0.01]
Study degree (ref. no degree):								
BA or equivalent	0.12**	[0.05]	0.11*	[0.05]	0.19***	[0.05]	0.19***	[0.05]
MA or equivalent	0.20***	[0.05]	0.20***	[0.05]	0.21***	[0.05]	0.21***	[0.05]
Children in the household (ref. no children)	-0.04	[0.05]	-0.04	[0.05]	0.01	[0.05]	0.02	[0.05]
Migration background (ref. no migration background)	0.06*	[0.03]	0.06*	[0.03]	0.00	[0.03]	0.00	[0.03]
Parents' socioeconomic background (std.)	0.02*	[0.01]	0.02*	[0.01]	0.01	[0.01]	0.01	[0.01]
Teacher oversampling (ref. not part of the oversampling)	0.02	[0.03]	0.02	[0.03]	0.02	[0.04]	0.02	[0.04]
<i>Regional controls</i>								
Size of service sector in the study region (std.)	-0.02*	[0.01]	-0.02*	[0.01]	-0.02+	[0.01]	-0.02+	[0.01]
Median income level of the study region (std.)	0.05***	[0.01]	0.05***	[0.01]	0.04***	[0.01]	0.04***	[0.01]
Population size in the study region (std.)	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]
N	2,857		2,857		1,813		1,813	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 imputations.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.6. Joint Regression of Log. Hourly Wages on Mobility After Graduation, Gender, and Partnerships.

	All Graduates							
	Model 1		Model 2		Model 3		Model 4	
<i>Mobility for the first job (ref. staying at the place of study):</i>								
Home-comers	0.01	[0.02]	0.01	[0.02]	0.02	[0.03]	0.02	[0.04]
Short-distance mobility	0.05**	[0.02]	0.05**	[0.02]	0.03	[0.03]	0.04	[0.03]
Long-distance mobility	0.04*	[0.02]	0.04*	[0.02]	0.07*	[0.03]	0.01	[0.03]
<i>Graduates' gender (ref. male):</i>								
Female			-0.06***	[0.02]	-0.06*	[0.02]	-0.08**	[0.03]
<i>Partnerships (ref. living alone):</i>								
Cohabiting with a partner			0.01	[0.01]	0.01	[0.01]	-0.02	[0.03]
<i>Two-way interaction: gender x mobility</i>								
Female # home-comers					-0.03	[0.04]	-0.02	[0.05]
Female # short-distance mobility					0.03	[0.03]	0.08+	[0.04]
Female # long-distance mobility					-0.05	[0.04]	0.03	[0.05]
<i>Two-way interaction: gender x partner</i>								
Female # Cohabiting with a partner							0.07	[0.05]
<i>Two-way interaction: mobility x partner</i>								
Home-comers # cohabiting with a partner							0.02	[0.06]
Short-distance mobility # cohabiting with a partner							-0.02	[0.05]
Long-distance mobility # cohabiting with a partner							0.14**	[0.05]
<i>Three-way interaction: gender x mobility x partner</i>								
Female # home-comers # cohabiting with a partner							-0.03	[0.08]
Female # short-distance mobility # cohabiting with a partner							-0.10	[0.07]
Female # Long-distance mobility # cohabiting with a partner							-0.18*	[0.08]
<i>Individual controls</i>								
Status expectations (std.)			0.05***	[0.01]	0.05***	[0.01]	0.05***	[0.01]
Final grade (std.)			0.03**	[0.01]	0.03**	[0.01]	0.03**	[0.01]
<i>Field of study (ref. arts and humanities):</i>								
Economics			0.13***	[0.03]	0.13***	[0.03]	0.13***	[0.03]
Sciences			0.17***	[0.02]	0.17***	[0.02]	0.17***	[0.02]
Teaching			0.18***	[0.03]	0.18***	[0.03]	0.18***	[0.03]
<i>Personality (Big 5)</i>								
Extraversion (std.)			0.02**	[0.01]	0.02**	[0.01]	0.02**	[0.01]
Agreeableness (std.)			-0.00	[0.01]	-0.00	[0.01]	-0.00	[0.01]
Conscientiousness (std.)			0.02*	[0.01]	0.02*	[0.01]	0.02*	[0.01]
Neuroticism (std.)			0.00	[0.01]	0.00	[0.01]	0.00	[0.01]
Openness to experience (std.)			-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]
Age at graduation (std.)			0.04***	[0.01]	0.04***	[0.01]	0.04***	[0.01]

Table A7.6. (Continued).

	All graduates					
	Model 1	Model 2	Model 3	Model 4		
Study degree (ref. no degree):						
BA or equivalent	0.13**	[0.04]	0.14**	[0.04]	0.13**	[0.04]
MA or equivalent	0.20***	[0.04]	0.20***	[0.04]	0.20***	[0.04]
Children in the household (ref. no children)	-0.03	[0.03]	-0.03	[0.03]	-0.03	[0.03]
Migration background (ref. no migration background)	0.03	[0.02]	0.03	[0.02]	0.03	[0.02]
Parents' socioeconomic background (std.)	0.01*	[0.01]	0.01*	[0.01]	0.01*	[0.01]
Teacher oversampling (ref. not part of the oversampling)	0.01	[0.03]	0.01	[0.03]	0.01	[0.03]
<i>Regional controls</i>						
Size of service sector in the study region (std.)	-0.02*	[0.01]	-0.02*	[0.01]	-0.02*	[0.01]
Median income level of the study region (std.)	0.05***	[0.01]	0.05***	[0.01]	0.05***	[0.01]
Population size in the study region (std.)	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]
<i>Entropy balancing weights</i>						
<i>N</i>	4,670	✓	✓	✓	✓	✓

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.7. Regression of Log. Hourly Wages on Women's Mobility After Graduation.

	Women					
	Model 1		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>						
Home-comers	0.01	[0.02]	0.00	[0.02]	0.01	[0.03]
Short-distance mobility	0.07***	[0.02]	0.06**	[0.02]	0.12***	[0.03]
Long-distance mobility	0.03	[0.02]	0.02	[0.02]	0.04	[0.03]
<i>Partnerships (ref. living alone):</i>						
Cohabiting with a partner			0.00	[0.02]	0.05	[0.03]
<i>Interaction between mobility and cohabiting with a partner:</i>						
Home-comers # Cohabiting with a partner					-0.01	[0.05]
Short-distance mobility # Cohabiting with a partner					-0.12**	[0.04]
Long-distance mobility # Cohabiting with a partner					-0.05	[0.05]
<i>Individual controls</i>						
Status expectations (std.)			0.05***	[0.01]	0.05***	[0.01]
Final grade (std.)			0.02*	[0.01]	0.02*	[0.01]
Field of study (ref. arts and humanities):						
Economics			0.10**	[0.03]	0.10**	[0.03]
Sciences			0.14***	[0.03]	0.15***	[0.03]
Teaching			0.16***	[0.03]	0.16***	[0.03]
Personality (Big 5)						
Extraversion (std.)			0.02	[0.01]	0.02	[0.01]
Agreeableness (std.)			-0.01	[0.01]	-0.01	[0.01]
Conscientiousness (std.)			0.01	[0.01]	0.01	[0.01]
Neuroticism (std.)			-0.00	[0.01]	-0.00	[0.01]
Openness to experience (std.)			-0.00	[0.01]	-0.00	[0.01]
Age at graduation (std.)			0.04***	[0.01]	0.04***	[0.01]
Study degree (ref. no degree):						
BA or equivalent			0.11*	[0.06]	0.11*	[0.06]
MA or equivalent			0.21***	[0.06]	0.21***	[0.06]
Children in the household (ref. no children)			-0.05	[0.05]	-0.05	[0.05]
Migration background (ref. no migration background)			0.06*	[0.03]	0.06*	[0.03]
Parents' socioeconomic background (std.)			0.02*	[0.01]	0.02*	[0.01]
Teacher oversampling (ref. not part of the oversampling)			0.01	[0.03]	0.01	[0.03]
<i>Regional controls</i>						
Size of service sector in the study region (std.)			-0.02*	[0.01]	-0.02*	[0.01]
Median income level of the study region (std.)			0.05***	[0.01]	0.05***	[0.01]
Population size in the study region (std.)			-0.01	[0.01]	-0.01	[0.01]
<i>Entropy balancing weights</i>			✓		✓	
N	2,857		2,857		2,857	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.8. Regression of Log. Hourly Wages on Men's Mobility After Graduation.

	Men					
	Model 1		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>						
Home-comers	0.02	[0.03]	0.02	[0.03]	0.01	[0.04]
Short-distance mobility	0.02	[0.03]	0.03	[0.03]	0.03	[0.04]
Long-distance mobility	0.05 ⁺	[0.03]	0.06 [*]	[0.03]	0.00	[0.03]
<i>Partnerships (ref. living alone):</i>						
Cohabiting with a partner			0.00	[0.02]	-0.03	[0.03]
<i>Interaction between mobility and cohabiting with a partner:</i>						
Home-comers # Cohabiting with a partner					0.03	[0.06]
Short-distance mobility # Cohabiting with a partner					-0.01	[0.05]
Long-distance mobility # Cohabiting with a partner					0.14 ^{**}	[0.06]
<i>Individual controls</i>						
Status expectations (std.)			0.04 ^{***}	[0.01]	0.04 ^{***}	[0.01]
Final grade (std.)			0.04 ^{**}	[0.01]	0.04 ^{**}	[0.01]
Field of study (ref. arts and humanities):						
Economics			0.22 ^{***}	[0.05]	0.21 ^{***}	[0.05]
Sciences			0.26 ^{***}	[0.04]	0.25 ^{***}	[0.04]
Teaching			0.24 ^{***}	[0.06]	0.23 ^{***}	[0.06]
Personality (Big 5)						
Extraversion (std.)			0.02 [*]	[0.01]	0.02 [*]	[0.01]
Agreeableness (std.)			0.00	[0.01]	0.00	[0.01]
Conscientiousness (std.)			0.03 [*]	[0.01]	0.03 [*]	[0.01]
Neuroticism (std.)			0.01	[0.01]	0.01	[0.01]
Openness to experience (std.)			-0.00	[0.01]	-0.00	[0.01]
Age at graduation (std.)			0.05 ^{***}	[0.01]	0.05 ^{***}	[0.01]
Study degree (ref. no degree):						
BA or equivalent			0.19 ^{**}	[0.06]	0.18 ^{**}	[0.06]
MA or equivalent			0.21 ^{**}	[0.07]	0.20 ^{**}	[0.07]
Children in the household (ref. no children)			0.00	[0.04]	0.00	[0.04]
Migration background (ref. no migration background)			-0.01	[0.03]	-0.01	[0.03]
Parents' socioeconomic background (std.)			0.01	[0.01]	0.01	[0.01]
Teacher oversampling (ref. not part of the oversampling)			0.00	[0.06]	0.00	[0.06]
<i>Regional controls</i>						
Size of service sector in the study region (std.)			-0.01	[0.01]	-0.01	[0.01]
Median income level of the study region (std.)			0.04 ^{**}	[0.01]	0.04 ^{**}	[0.01]
Population size in the study region (std.)			-0.01	[0.01]	-0.01	[0.01]
<i>Entropy balancing weights</i>			✓		✓	
<i>N</i>	1.813		1.813		1.813	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

Table A7.9. Robustness Check: Regression of Log. Monthly Wages on Women's Mobility After Graduation.

	Women					
	Model 1		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>						
Home-comers	0.05 ⁺	[0.03]	0.06 [*]	[0.03]	0.10 [*]	[0.04]
Short-distance mobility	0.14 ^{***}	[0.02]	0.14 ^{***}	[0.02]	0.21 ^{***}	[0.03]
Long-distance mobility	0.14 ^{***}	[0.03]	0.12 ^{***}	[0.03]	0.20 ^{***}	[0.04]
<i>Partnerships (ref. living alone):</i>						
Cohabiting with a partner			0.01	[0.02]	0.11 ^{**}	[0.04]
<i>Interaction between mobility and cohabiting with a partner:</i>						
Home-comers # Cohabiting with a partner					-0.09	[0.06]
Short-distance mobility # Cohabiting with a partner					-0.16 ^{**}	[0.05]
Long-distance mobility # Cohabiting with a partner					-0.19 ^{**}	[0.06]
<i>Individual controls</i>						
Status expectations (std.)			0.02	[0.01]	0.02	[0.01]
Final grade (std.)			0.01	[0.01]	0.01	[0.01]
Field of study (ref. arts and humanities):						
Economics			0.18 ^{***}	[0.04]	0.18 ^{***}	[0.04]
Sciences			0.25 ^{***}	[0.04]	0.25 ^{***}	[0.04]
Teaching			0.06 ⁺	[0.03]	0.06 ⁺	[0.03]
Personality (Big 5)						
Extraversion (std.)			0.02 [*]	[0.01]	0.02 [*]	[0.01]
Agreeableness (std.)			-0.01	[0.01]	-0.01	[0.01]
Conscientiousness (std.)			0.01	[0.01]	0.02	[0.01]
Neuroticism (std.)			-0.01	[0.01]	-0.01	[0.01]
Openness to experience (std.)			-0.01	[0.01]	-0.01	[0.01]
Age at graduation (std.)			0.04 ^{***}	[0.01]	0.04 ^{***}	[0.01]
Study degree (ref. no degree):						
BA or equivalent			0.17 ^{**}	[0.06]	0.16 ^{**}	[0.06]
MA or equivalent			0.21 ^{***}	[0.06]	0.21 ^{***}	[0.06]
Children in the household (ref. no children)			-0.11 [*]	[0.05]	-0.11 [*]	[0.05]
Migration background (ref. no migration background)			0.05	[0.03]	0.05	[0.03]
Parents' socioeconomic background (std.)			0.01	[0.01]	0.01	[0.01]
Teacher oversampling (ref. not part of the oversampling)			0.02	[0.03]	0.02	[0.03]
<i>Regional controls</i>						
Size of service sector in the study region (std.)			-0.02	[0.01]	-0.02	[0.01]
Median income level of the study region (std.)			0.07 ^{***}	[0.02]	0.07 ^{***}	[0.02]
Population size in the study region (std.)			-0.01	[0.01]	-0.01	[0.01]
<i>Entropy balancing weights</i>						
N	2,857		✓		✓	
	2,857		2,857		2,857	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

Table A7.10. Robustness Check: Regression of Log. Monthly Wages on Men's Mobility After Graduation.

	Men					
	Model 1		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>						
Home-comers	0.03	[0.03]	0.06 ⁺	[0.03]	0.07 ⁺	[0.04]
Short-distance mobility	0.09 ^{**}	[0.03]	0.09 ^{**}	[0.03]	0.10 [*]	[0.04]
Long-distance mobility	0.12 ^{***}	[0.03]	0.14 ^{***}	[0.03]	0.11 ^{**}	[0.04]
<i>Partnerships (ref. living alone):</i>						
Cohabiting with a partner			0.04	[0.03]	0.05	[0.04]
<i>Interaction between mobility and cohabiting with a partner:</i>						
Home-comers # Cohabiting with a partner					-0.03	[0.07]
Short-distance mobility # Cohabiting with a partner					-0.04	[0.06]
Long-distance mobility # Cohabiting with a partner					0.06	[0.06]
<i>Individual controls</i>						
Status expectations (std.)			0.02	[0.02]	0.02	[0.02]
Final grade (std.)			0.01	[0.01]	0.01	[0.01]
Field of study (ref. arts and humanities):						
Economics			0.31 ^{***}	[0.06]	0.31 ^{***}	[0.06]
Sciences			0.35 ^{***}	[0.05]	0.35 ^{***}	[0.05]
Teaching			0.15 [*]	[0.07]	0.14 [*]	[0.07]
Personality (Big 5)						
Extraversion (std.)			0.02 ⁺	[0.01]	0.02 ⁺	[0.01]
Agreeableness (std.)			-0.00	[0.01]	-0.01	[0.01]
Conscientiousness (std.)			0.04 ^{**}	[0.01]	0.04 ^{**}	[0.01]
Neuroticism (std.)			0.01	[0.01]	0.01	[0.01]
Openness to experience (std.)			-0.00	[0.01]	-0.00	[0.01]
Age at graduation (std.)			0.05 ^{***}	[0.01]	0.05 ^{***}	[0.01]
Study degree (ref. no degree):						
BA or equivalent			0.24 ^{***}	[0.07]	0.23 ^{**}	[0.07]
MA or equivalent			0.26 ^{***}	[0.07]	0.25 ^{***}	[0.07]
Children in the household (ref. no children)			-0.03	[0.05]	-0.03	[0.05]
Migration background (ref. no migration background)			0.00	[0.03]	0.00	[0.03]
Parents' socioeconomic background (std.)			0.00	[0.01]	0.00	[0.01]
Teacher oversampling (ref. not part of the oversampling)			0.02	[0.07]	0.02	[0.07]
<i>Regional controls</i>						
Size of service sector in the study region (std.)			-0.01	[0.01]	-0.01	[0.01]
Median income level of the study region (std.)			0.04 [*]	[0.02]	0.04 [*]	[0.02]
Population size in the study region (std.)			0.00	[0.01]	0.00	[0.01]
<i>Entropy balancing weights</i>						
N	1,813		✓	1, 813	✓	1,813

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

Table A7.11. Robustness Check: Regression of Log. Hourly Wages on Mobility After Graduation by Gender, Reduced Sample With Graduates Having at Least 30 Contracted Working Hours Per Week (Full Models).

	Women				Men			
	Model 2		Model 3		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>								
Home-comers	0.02	[0.03]	0.03	[0.04]	0.01	[0.03]	-0.02	[0.04]
Short-distance mobility	0.07**	[0.03]	0.12***	[0.03]	0.02	[0.03]	0.01	[0.04]
Long-distance mobility	0.05 ⁺	[0.03]	0.07*	[0.04]	0.05 ⁺	[0.03]	0.01	[0.04]
<i>Partnerships (ref. living alone):</i>								
Cohabiting with a partner	0.00	[0.02]	0.05	[0.04]	0.03	[0.03]	-0.01	[0.04]
<i>Interaction between mobility and cohabiting with a partner:</i>								
Home-comers # Cohabiting with a partner			-0.04	[0.06]			0.06	[0.06]
Short-distance mobility # Cohabiting with a partner			-0.10*	[0.05]			0.02	[0.05]
Long-distance mobility # Cohabiting with a partner			-0.06	[0.06]			0.11 ⁺	[0.06]
<i>Individual controls</i>								
Status expectations (std.)	0.04**	[0.01]	0.04**	[0.01]	0.03*	[0.01]	0.03*	[0.01]
Final grade (std.)	0.02*	[0.01]	0.02*	[0.01]	0.05**	[0.01]	0.04**	[0.01]
<i>Field of study (ref. arts and humanities):</i>								
Economics	0.15***	[0.03]	0.15***	[0.03]	0.25***	[0.05]	0.25***	[0.05]
Sciences	0.20***	[0.03]	0.20***	[0.03]	0.28***	[0.05]	0.28***	[0.05]
Teaching	0.01	[0.03]	0.01	[0.03]	0.11 ⁺	[0.06]	0.11 ⁺	[0.06]
<i>Personality (Big 5)</i>								
Extraversion (std.)	0.02*	[0.01]	0.02*	[0.01]	0.02*	[0.01]	0.03*	[0.01]
Agreeableness (std.)	-0.02*	[0.01]	-0.02*	[0.01]	-0.00	[0.01]	-0.00	[0.01]
Conscientiousness (std.)	0.01	[0.01]	0.01	[0.01]	0.03**	[0.01]	0.03**	[0.01]
Neuroticism (std.)	-0.01	[0.01]	-0.02	[0.01]	0.01	[0.01]	0.01	[0.01]
Openness to experience (std.)	-0.00	[0.01]	-0.00	[0.01]	0.01	[0.01]	0.01	[0.01]
Age at graduation (std.)	0.04***	[0.01]	0.04***	[0.01]	0.05***	[0.01]	0.05***	[0.01]
<i>Study degree (ref. no degree):</i>								
BA or equivalent	0.18**	[0.07]	0.17*	[0.07]	0.19**	[0.06]	0.18**	[0.06]
MA or equivalent	0.24***	[0.07]	0.24***	[0.07]	0.20**	[0.06]	0.19**	[0.06]
Children in the household (ref. no children)	-0.07	[0.06]	-0.06	[0.06]	-0.01	[0.05]	-0.01	[0.05]
Migration background (ref. no migration background)	0.05 ⁺	[0.03]	0.05 ⁺	[0.03]	-0.01	[0.03]	-0.01	[0.03]
Parents' socioeconomic background (std.)	0.02*	[0.01]	0.02*	[0.01]	0.01	[0.01]	0.01	[0.01]
Teacher oversampling (ref. not part of the oversampling)	0.02	[0.04]	0.02	[0.04]	-0.08	[0.07]	-0.08	[0.07]
<i>Regional controls</i>								
Size of service sector in the study region (std.)	-0.01	[0.01]	-0.01	[0.01]	-0.02*	[0.01]	-0.02	[0.01]
Median income level of the study region (std.)	0.06***	[0.01]	0.06***	[0.01]	0.04*	[0.02]	0.04*	[0.02]
Population size in the study region (std.)	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]	-0.01	[0.01]
<i>N</i>	1,954		1,954		1,499		1,499	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.12. Robustness Check: Regression of Log. Hourly Wages on Mobility After Graduation for Female Graduates, Using Differentiated Cut-off Values of Mobility.

	Women					
	Model 1		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>						
Home-comers	0.01	[0.02]	0.00	[0.02]	0.01	[0.03]
Mobility (< 30 min)	0.08*	[0.04]	0.04	[0.04]	0.10 ⁺	[0.06]
Mobility (30–60 min)	0.07**	[0.03]	0.06**	[0.02]	0.10**	[0.03]
Mobility (60–90 min)	0.07 ⁺	[0.04]	0.08*	[0.04]	0.15***	[0.04]
Mobility (90–120 min)	-0.00	[0.04]	-0.02	[0.04]	-0.01	[0.04]
Mobility (120–150 min)	0.05	[0.04]	0.02	[0.05]	0.10 ⁺	[0.05]
Mobility (150–180 min)	0.07	[0.08]	-0.05	[0.10]	0.06	[0.09]
Mobility (> 180 min)	0.04	[0.03]	0.04	[0.03]	0.04	[0.04]
<i>Partnerships (ref. living alone):</i>						
Cohabiting with a partner			0.01	[0.02]	0.05	[0.03]
<i>Interaction between mobility and cohabiting with a partner:</i>						
Home-comers # Cohabiting with a partner					-0.01	[0.05]
Mobility (< 30 min) # Cohabiting with a partner					-0.13 ⁺	[0.08]
Mobility (30–60 min) # Cohabiting with a partner					-0.09 ⁺	[0.05]
Mobility (60–90 min) # Cohabiting with a partner					-0.18**	[0.06]
Mobility (90–120 min) # Cohabiting with a partner					-0.02	[0.10]
Mobility (120–150 min) # Cohabiting with a partner					-0.16	[0.11]
Mobility (150–180 min) # Cohabiting with a partner					-0.25	[0.19]
Mobility (> 180 min) # Cohabiting with a partner					-0.00	[0.06]
<i>Individual controls</i>						
Status expectations (std.)			0.05***	[0.01]	0.05***	[0.01]
Final grade (std.)			0.02 ⁺	[0.01]	0.02 ⁺	[0.01]
Field of study (ref. arts and humanities):						
Economics			0.10**	[0.03]	0.10**	[0.03]
Sciences			0.14***	[0.03]	0.15***	[0.03]
Teaching			0.16***	[0.03]	0.16***	[0.03]
Personality (Big 5)						
Extraversion (std.)			0.02	[0.01]	0.02 ⁺	[0.01]
Agreeableness (std.)			-0.01	[0.01]	-0.01	[0.01]
Conscientiousness (std.)			0.01	[0.01]	0.01	[0.01]
Neuroticism (std.)			-0.00	[0.01]	-0.00	[0.01]
Openness to experience (std.)			-0.00	[0.01]	-0.00	[0.01]
Age at graduation (std.)			0.04***	[0.01]	0.03***	[0.01]
Study degree (ref. no degree):						
BA or equivalent			0.12 [*]	[0.06]	0.11 ⁺	[0.06]
MA or equivalent			0.21***	[0.06]	0.20***	[0.06]
Children in the household (ref. no children)			-0.05	[0.05]	-0.06	[0.05]
Migration background (ref. no migration background)			0.06 [*]	[0.03]	0.06 [*]	[0.03]
Parents' socioeconomic background (std.)			0.02 [*]	[0.01]	0.02 [*]	[0.01]
Teacher oversampling (ref. not part of the oversampling)			0.01	[0.03]	0.01	[0.03]
<i>Regional controls</i>						
Size of service sector in the study region (std.)			-0.02 [*]	[0.01]	-0.02 [*]	[0.01]
Median income level of the study region (std.)			0.05***	[0.01]	0.05***	[0.01]
Population size in the study region (std.)			-0.01	[0.01]	-0.01	[0.01]
<i>Entropy balancing weights</i>						
	✓		✓		✓	
N	2,857		2,857		2,857	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.13. Robustness Check: Regression of Log. Hourly Wages on Mobility After Graduation for Male Graduates, Using Differentiated Cut-off Values of Mobility.

	Men					
	Model 1		Model 2		Model 3	
<i>Mobility for the first job (ref. staying at the place of study):</i>						
Home-comers	0.02	[0.03]	0.02	[0.03]	0.01	[0.04]
Mobility (< 30 min)	0.09*	[0.05]	0.03	[0.05]	0.01	[0.06]
Mobility (30–60 min)	0.01	[0.03]	0.02	[0.03]	0.05	[0.04]
Mobility (60–90 min)	0.00	[0.04]	0.04	[0.05]	0.02	[0.07]
Mobility (90–120 min)	0.01	[0.05]	0.04	[0.05]	-0.03	[0.07]
Mobility (120–150 min)	0.00	[0.05]	-0.00	[0.06]	-0.09	[0.07]
Mobility (150–180 min)	0.00	[0.09]	0.01	[0.09]	-0.04	[0.09]
Mobility (> 180 min)	0.08*	[0.03]	0.09**	[0.03]	0.05	[0.04]
<i>Partnerships (ref. living alone):</i>						
Cohabiting with a partner			0.00	[0.02]	-0.03	[0.03]
<i>Interaction between mobility and cohabiting with a partner:</i>						
Home-comers # Cohabiting with a partner					0.03	[0.06]
Mobility (< 30 min) # Cohabiting with a partner					0.05	[0.10]
Mobility (30–60 min) # Cohabiting with a partner					-0.08	[0.06]
Mobility (60–90 min) # Cohabiting with a partner					0.06	[0.08]
Mobility (90–120 min) # Cohabiting with a partner					0.19 ⁺	[0.11]
Mobility (120–150 min) # Cohabiting with a partner					0.22*	[0.10]
Mobility (150–180 min) # Cohabiting with a partner					0.15	[0.22]
Mobility (> 180 min) # Cohabiting with a partner					0.11	[0.07]
<i>Individual controls</i>						
Status expectations (std.)			0.04***	[0.01]	0.04***	[0.01]
Final grade (std.)			0.04**	[0.01]	0.04**	[0.01]
Field of study (ref. arts and humanities):						
Economics			0.22***	[0.05]	0.22***	[0.05]
Sciences			0.26***	[0.04]	0.25***	[0.04]
Teaching			0.25***	[0.06]	0.24***	[0.06]
Personality (Big 5)						
Extraversion (std.)			0.02*	[0.01]	0.02*	[0.01]
Agreeableness (std.)			0.00	[0.01]	0.00	[0.01]
Conscientiousness (std.)			0.03*	[0.01]	0.02*	[0.01]
Neuroticism (std.)			0.01	[0.01]	0.01	[0.01]
Openness to experience (std.)			-0.00	[0.01]	-0.00	[0.01]
Age at graduation (std.)			0.05***	[0.01]	0.05***	[0.01]
Study degree (ref. no degree):						
BA or equivalent			0.19**	[0.06]	0.18**	[0.06]
MA or equivalent			0.21**	[0.06]	0.20**	[0.06]
Children in the household (ref. no children)			-0.00	[0.04]	-0.00	[0.04]
Migration background (ref. no migration background)			-0.01	[0.03]	-0.01	[0.03]
Parents' socioeconomic background (std.)			0.01	[0.01]	0.01	[0.01]
Teacher oversampling (ref. not part of the oversampling)			-0.00	[0.06]	0.00	[0.06]
<i>Regional controls</i>						
Size of service sector in the study region (std.)			-0.01	[0.01]	-0.01	[0.01]
Median income level of the study region (std.)			0.04**	[0.01]	0.04**	[0.01]
Population size in the study region (std.)			-0.01	[0.01]	-0.01	[0.01]
<i>Entropy balancing weights</i>						
	✓		✓		✓	
N	1,813		1,813		1,813	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.14. Robustness Check: Blinder-Oaxaca Decomposition of the Gender Difference in Hourly Wages in Explained Differences Due to Endowment and in Unexplained Differences Due to Differences in Returns.

	Graduates Cohabiting With a Partner		Graduates Living Alone	
Men's hourly wages	24.52 ^{***}	[0.34]	24.02 ^{***}	[0.29]
Women's hourly wages	22.61 ^{***}	[0.28]	22.01 ^{***}	[0.24]
Overall difference	1.91 ^{***}	[0.44]	2.01 ^{***}	[0.37]
Explained difference	0.87 [*]	[0.34]	0.52 [*]	[0.26]
Unexplained difference	1.04 [*]	[0.52]	1.49 ^{***}	[0.42]
<i>Explained difference (difference in endowments)</i>				
Home-comers	0.00	[0.02]	0.01	[0.01]
Short-distance mobility	-0.00	[0.01]	-0.02	[0.03]
Long-distance mobility	0.07 ⁺	[0.04]	-0.01	[0.01]
Individual controls	0.78 [*]	[0.34]	0.52 [*]	[0.26]
Regional controls	0.02	[0.05]	0.02	[0.03]
<i>Unexplained difference (difference in returns)</i>				
Home-comers	0.17	[0.20]	0.20	[0.19]
Short-distance mobility	0.15	[0.27]	-0.40 ⁺	[0.23]
Long-distance mobility	0.64 [*]	[0.25]	-0.06	[0.25]
Individual controls	1.67	[2.68]	1.93	[2.05]
Regional controls	0.01	[0.05]	0.00	[0.03]
Constant	-1.59	[2.72]	-0.18	[2.13]
<i>N</i>	1,944		2,726	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR — INKAR Database. 20 Imputations.

⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$

Table A7.15. Effect Heterogeneity by Status Expectations: Regression of Log. Hourly Wages on Mobility After Graduation by Gender and Cohabiting Partners.

	Women				Men			
	Living Alone		Cohabiting With Partner		Living Alone		Cohabiting With Partner	
Mobility for the first job (ref. staying at the place of study):								
Home-comers	0.00	[0.03]	-0.00	[0.04]	0.01	[0.04]	0.03	[0.05]
Short-distance mobility	0.11***	[0.03]	-0.00	[0.03]	0.03	[0.04]	0.02	[0.04]
Long-distance mobility	0.04	[0.03]	-0.01	[0.04]	0.00	[0.04]	0.14**	[0.04]
Status expectations (std.)	0.02	[0.03]	0.05 ⁺	[0.03]	0.05 [*]	[0.02]	0.01	[0.03]
Interaction between mobility and status expectations:								
Home-comers # status expectations	0.01	[0.04]	0.04	[0.04]	-0.01	[0.03]	0.03	[0.04]
Short-distance mobility # status expectations	0.03	[0.04]	0.04	[0.04]	-0.04	[0.04]	0.07 ⁺	[0.03]
Long-distance mobility # status expectations	0.03	[0.03]	0.00	[0.04]	-0.02	[0.04]	0.06	[0.04]
Individual controls								
Final grade (std.)	0.02 ⁺	[0.01]	0.01	[0.02]	0.04**	[0.02]	0.03	[0.02]
Field of study (ref. arts and humanities):								
Economics	0.07 ⁺	[0.04]	0.15***	[0.04]	0.23***	[0.06]	0.19**	[0.07]
Sciences	0.12***	[0.03]	0.17***	[0.04]	0.28***	[0.05]	0.21***	[0.06]
Teaching	0.18***	[0.04]	0.14**	[0.05]	0.26***	[0.07]	0.18 [*]	[0.08]
Personality (Big 5)								
Extraversion (std.)	0.00	[0.01]	0.03 [*]	[0.01]	0.03 [*]	[0.01]	0.01	[0.02]
Agreeableness (std.)	-0.00	[0.01]	-0.01	[0.01]	-0.00	[0.01]	0.00	[0.02]
Conscientiousness (std.)	0.01	[0.01]	0.02	[0.01]	0.03 [*]	[0.02]	0.02	[0.02]
Neuroticism (std.)	-0.00	[0.01]	0.00	[0.02]	0.01	[0.01]	0.00	[0.02]
Openness to experience (std.)	-0.01	[0.01]	-0.00	[0.01]	0.01	[0.01]	-0.02	[0.02]
Age at graduation (std.)	0.05***	[0.01]	0.02	[0.01]	0.06***	[0.02]	0.04 [*]	[0.02]
Study degree (ref. no degree):								
BA or equivalent	0.18 [*]	[0.08]	0.03	[0.08]	0.17 [*]	[0.08]	0.23 [*]	[0.11]
MA or equivalent	0.26**	[0.08]	0.15 ⁺	[0.08]	0.21**	[0.08]	0.19 ⁺	[0.11]
Children in the household (ref. no children)	0.01	[0.10]	-0.06	[0.05]	0.07	[0.13]	-0.00	[0.05]
Migration background (ref. no migration background)	0.06	[0.03]	0.06	[0.04]	-0.02	[0.04]	0.02	[0.05]
Parents' socioeconomic background (std.)	0.03 [*]	[0.01]	0.01	[0.01]	-0.00	[0.02]	0.03	[0.02]
Teacher oversampling (ref. not part of the oversampling)	-0.02	[0.04]	0.05	[0.05]	0.06	[0.08]	-0.08	[0.08]
Regional controls								
Size of service sector in the study region (std.)	-0.03 [*]	[0.01]	-0.02	[0.02]	-0.01	[0.01]	-0.01	[0.02]
Median income level of the study region (std.)	0.04**	[0.01]	0.06**	[0.02]	0.04 [*]	[0.02]	0.03	[0.02]
Population size in the study region (std.)	-0.01	[0.01]	-0.00	[0.01]	-0.01	[0.01]	-0.02	[0.02]
Entropy balancing weights								
N	✓ 1,596		✓ 1,261		✓ 1,125		✓ 688	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7. 16. Effect Heterogeneity by Final Grades: Regression of Log. Hourly Wages on Mobility After Graduation by Gender and Cohabiting Partners.

	Women				Men			
	Living Alone		Cohabiting With Partner		Living Alone		Cohabiting With Partner	
<i>Mobility for the first job (ref. staying at the place of study):</i>								
Home-comers	0.00	[0.03]	0.00	[0.04]	0.01	[0.04]	0.03	[0.05]
Short-distance mobility	0.11***	[0.03]	0.00	[0.03]	0.03	[0.04]	0.02	[0.04]
Long-distance mobility	0.04	[0.03]	-0.01	[0.04]	0.01	[0.04]	0.15***	[0.04]
Final grade (std.)	0.04*	[0.02]	0.05+	[0.02]	0.06+	[0.03]	0.03	[0.03]
<i>Interaction between mobility and final grade:</i>								
Home-comers # final grade	-0.00	[0.04]	-0.05	[0.05]	-0.04	[0.04]	0.06	[0.05]
Short-distance mobility # final grade	-0.02	[0.03]	-0.07*	[0.03]	-0.02	[0.04]	0.03	[0.05]
Long-distance mobility # final grade	-0.04	[0.03]	-0.05	[0.04]	-0.01	[0.04]	-0.06	[0.05]
<i>Individual controls</i>								
Status expectations (std.)	0.03*	[0.02]	0.07***	[0.02]	0.04**	[0.01]	0.05**	[0.01]
Field of study (ref. arts and humanities):								
Economics	0.07+	[0.04]	0.14***	[0.04]	0.24***	[0.06]	0.18**	[0.06]
Sciences	0.12***	[0.03]	0.17***	[0.04]	0.28***	[0.05]	0.21***	[0.06]
Teaching	0.18***	[0.04]	0.14**	[0.05]	0.26***	[0.07]	0.18*	[0.08]
Personality (Big 5)								
Extraversion (std.)	0.00	[0.01]	0.03*	[0.01]	0.03*	[0.01]	0.01	[0.02]
Agreeableness (std.)	-0.00	[0.01]	-0.01	[0.01]	-0.00	[0.01]	0.00	[0.02]
Conscientiousness (std.)	0.01	[0.01]	0.02	[0.01]	0.03*	[0.02]	0.01	[0.02]
Neuroticism (std.)	-0.00	[0.01]	0.00	[0.02]	0.01	[0.01]	-0.00	[0.02]
Openness to experience (std.)	-0.01	[0.01]	-0.00	[0.01]	0.01	[0.01]	-0.03	[0.02]
Age at graduation (std.)	0.05***	[0.01]	0.02	[0.01]	0.06***	[0.02]	0.04*	[0.02]
Study degree (ref. no degree):								
BA or equivalent	0.18*	[0.08]	0.03	[0.08]	0.17*	[0.08]	0.24*	[0.11]
MA or equivalent	0.25**	[0.08]	0.15+	[0.08]	0.21**	[0.08]	0.20+	[0.11]
Children in the household (ref. no children)	0.01	[0.10]	-0.05	[0.05]	0.08	[0.13]	0.01	[0.05]
Migration background (ref. no migration background)	0.06	[0.04]	0.06	[0.04]	-0.02	[0.04]	0.03	[0.05]
Parents' socioeconomic background (std.)	0.03*	[0.01]	0.01	[0.01]	-0.00	[0.02]	0.03+	[0.02]
Teacher oversampling (ref. not part of the oversampling)	-0.02	[0.04]	0.04	[0.05]	0.06	[0.08]	-0.08	[0.08]
<i>Regional controls</i>								
Size of service sector in the study region (std.)	-0.03*	[0.01]	-0.02	[0.02]	-0.01	[0.01]	-0.01	[0.02]
Median income level of the study region (std.)	0.04**	[0.01]	0.06**	[0.02]	0.04*	[0.02]	0.03	[0.02]
Population size in the study region (std.)	-0.01	[0.01]	-0.00	[0.01]	-0.01	[0.01]	-0.02	[0.02]
<i>Entropy balancing weights</i>								
N	✓	1,596	✓	1,261	✓	1,125	✓	688

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.17. Effect Heterogeneity by Field of Study: Regression of Log. Hourly Wages on Mobility After Graduation by Gender and Cohabiting Partners.

	Women				Men			
	Living Alone		Cohabiting With Partner		Living Alone		Cohabiting With Partner	
Mobility for the first job (ref. staying at the place of study):								
Home-comers	0.03	[0.06]	0.08	[0.08]	-0.06	[0.12]	0.21	[0.16]
Short-distance mobility	0.04	[0.05]	-0.05	[0.06]	-0.03	[0.15]	0.03	[0.12]
Long-distance mobility	-0.08	[0.05]	0.00	[0.06]	0.17 ⁺	[0.10]	0.05	[0.14]
Field of study (ref. arts and humanities):								
Economics	0.04	[0.06]	0.11 ⁺	[0.07]	0.22 [*]	[0.09]	0.19 [*]	[0.09]
Sciences	0.08	[0.05]	0.22 ^{***}	[0.06]	0.31 ^{***}	[0.09]	0.23 ^{***}	[0.07]
Teaching	0.12 [*]	[0.05]	0.13 [*]	[0.07]	0.30 ^{**}	[0.11]	0.14	[0.11]
Interaction between mobility and field of study:								
Home-comers # economics	-0.12	[0.10]	-0.06	[0.12]	0.12	[0.14]	-0.20	[0.19]
Home-comers # sciences	-0.05	[0.10]	-0.26 ^{**}	[0.09]	0.05	[0.13]	-0.19	[0.17]
Home-comers # teaching	-0.00	[0.08]	-0.03	[0.10]	0.10	[0.15]	-0.17	[0.20]
Short-distance mobility # economics	0.08	[0.09]	0.11	[0.10]	0.12	[0.17]	-0.08	[0.16]
Short-distance mobility # sciences	0.06	[0.08]	-0.01	[0.08]	0.05	[0.16]	-0.01	[0.13]
Short-distance mobility # teaching	0.12 ⁺	[0.07]	0.10	[0.08]	0.05	[0.19]	0.04	[0.16]
Long-distance mobility # economics	0.13	[0.09]	0.06	[0.11]	-0.11	[0.12]	0.14	[0.16]
Long-distance mobility # sciences	0.17 [*]	[0.07]	-0.02	[0.10]	-0.18 ⁺	[0.11]	0.03	[0.15]
Long-distance mobility # teaching	0.14 ⁺	[0.08]	-0.03	[0.10]	-0.28 ⁺	[0.15]	0.23	[0.18]
Individual controls								
Status expectations (std.)	0.03 [*]	[0.02]	0.07 ^{***}	[0.02]	0.04 ^{**}	[0.01]	0.05 ^{**}	[0.01]
Final grade (std.)	0.02 ⁺	[0.01]	0.01	[0.02]	0.04 [*]	[0.02]	0.04	[0.02]
Personality (Big 5)								
Extraversion (std.)	0.00	[0.01]	0.03 [*]	[0.01]	0.03 [*]	[0.01]	0.01	[0.02]
Agreeableness (std.)	-0.00	[0.01]	-0.01	[0.01]	-0.00	[0.01]	0.00	[0.02]
Conscientiousness (std.)	0.01	[0.01]	0.02	[0.01]	0.03 [*]	[0.02]	0.01	[0.02]
Neuroticism (std.)	-0.00	[0.01]	0.00	[0.02]	0.01	[0.01]	-0.00	[0.02]
Openness to experience (std.)	-0.01	[0.01]	0.00	[0.01]	0.01	[0.01]	-0.02	[0.02]
Age at graduation (std.)	0.05 ^{***}	[0.01]	0.02	[0.01]	0.06 ^{***}	[0.02]	0.04 [*]	[0.02]
Study degree (ref. no degree):								
BA or equivalent	0.17 [*]	[0.08]	0.01	[0.08]	0.16 [*]	[0.08]	0.25 [*]	[0.11]
MA or equivalent	0.25 ^{**}	[0.08]	0.14	[0.08]	0.21 ^{**}	[0.08]	0.21 ⁺	[0.11]
Children in the household (ref. no children)	0.00	[0.10]	-0.05	[0.05]	0.03	[0.12]	0.01	[0.05]
Migration background (ref. no migration background)	0.06	[0.04]	0.07	[0.04]	-0.02	[0.04]	0.02	[0.05]
Parents' socioeconomic background (std.)	0.03 [*]	[0.01]	0.01	[0.01]	0.00	[0.02]	0.03	[0.02]
Teacher oversampling (ref. not part of the oversampling)	-0.02	[0.04]	0.05	[0.05]	0.06	[0.08]	-0.08	[0.08]
Regional controls								
Size of service sector in the study region (std.)	-0.03 [*]	[0.01]	-0.02	[0.02]	-0.01	[0.01]	-0.01	[0.02]
Median income level of the study region (std.)	0.04 ^{**}	[0.01]	0.05 ^{**}	[0.02]	0.04 [*]	[0.02]	0.03	[0.02]
Population size in the study region (std.)	-0.02	[0.01]	-0.00	[0.01]	-0.01	[0.01]	-0.02	[0.02]
Entropy balancing weights								
N	✓		✓		✓		✓	
	1,596		1,261		1,125		688	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.18. Effect Heterogeneity by the Population Size of the Study Region: Regression of Log. Hourly Wages on Mobility After Graduation by Gender and Cohabiting Partners.

	Women				Men			
	Living Alone		Cohabiting With Partner		Living Alone		Cohabiting With Partner	
<i>Mobility for the first job (ref. staying at the place of study):</i>								
Home-comers	-0.01	[0.03]	-0.00	[0.04]	0.02	[0.04]	0.01	[0.06]
Short-distance mobility	0.14***	[0.03]	-0.01	[0.03]	0.03	[0.04]	0.03	[0.04]
Long-distance mobility	0.03	[0.03]	-0.00	[0.04]	0.01	[0.04]	0.15**	[0.04]
Population size (std.)	-0.03*	[0.01]	0.01	[0.02]	-0.01	[0.02]	-0.01	[0.02]
<i>Interaction between mobility and population size:</i>								
Home-comers # population size	-0.03	[0.05]	-0.05	[0.03]	0.05	[0.04]	-0.08	[0.11]
Short-distance mobility # population size	0.13**	[0.04]	-0.07*	[0.03]	-0.02	[0.05]	0.01	[0.04]
Long-distance mobility # population size	0.02	[0.03]	-0.02	[0.03]	0.02	[0.03]	-0.04	[0.06]
<i>Individual controls</i>								
Status expectations (std.)	0.03*	[0.02]	0.07***	[0.02]	0.04**	[0.01]	0.05**	[0.01]
Final grade (std.)	0.03*	[0.01]	0.01	[0.02]	0.04**	[0.02]	0.03	[0.02]
Field of study (ref. arts and humanities):								
Economics	0.07*	[0.04]	0.14***	[0.04]	0.23***	[0.06]	0.18**	[0.06]
Sciences	0.13***	[0.03]	0.17***	[0.04]	0.28***	[0.05]	0.21***	[0.06]
Teaching	0.17***	[0.04]	0.14**	[0.05]	0.26***	[0.07]	0.18*	[0.08]
Personality (Big 5)								
Extraversion (std.)	0.00	[0.01]	0.03*	[0.01]	0.03*	[0.01]	0.01	[0.02]
Agreeableness (std.)	-0.00	[0.01]	-0.01	[0.01]	-0.00	[0.01]	0.00	[0.02]
Conscientiousness (std.)	0.01	[0.01]	0.02	[0.01]	0.03*	[0.02]	0.01	[0.02]
Neuroticism (std.)	-0.00	[0.01]	0.00	[0.02]	0.01	[0.01]	0.00	[0.02]
Openness to experience (std.)	-0.01	[0.01]	-0.00	[0.01]	0.01	[0.01]	-0.02	[0.02]
Age at graduation (std.)	0.05***	[0.01]	0.02	[0.01]	0.06***	[0.02]	0.04*	[0.02]
Study degree (ref. no degree):								
BA or equivalent	0.18*	[0.08]	0.03	[0.08]	0.16*	[0.08]	0.24*	[0.10]
MA or equivalent	0.25**	[0.08]	0.15*	[0.08]	0.21**	[0.08]	0.20*	[0.11]
Children in the household (ref. no children)	-0.05	[0.11]	-0.05	[0.05]	0.07	[0.13]	0.01	[0.05]
Migration background (ref. no migration background)	0.06	[0.04]	0.06	[0.04]	-0.02	[0.04]	0.02	[0.05]
Parents' socioeconomic background (std.)	0.03*	[0.01]	0.01	[0.01]	-0.00	[0.01]	0.03	[0.02]
Teacher oversampling (ref. not part of the oversampling)	-0.02	[0.04]	0.04	[0.05]	0.06	[0.08]	-0.08	[0.08]
<i>Regional controls</i>								
Size of service sector in the study region (std.)	-0.03*	[0.01]	-0.02	[0.02]	-0.01	[0.01]	-0.01	[0.02]
Median income level in the study region (std.)	0.04*	[0.01]	0.06***	[0.02]	0.04*	[0.02]	0.03	[0.02]
<i>Entropy balancing weights</i>								
N	✓	1,596	✓	1,261	✓	1,125	✓	688

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.19. Effect Heterogeneity by the Median Income Level of the Study Region: Regression of Log. Hourly Wages on Mobility After Graduation by Gender and Cohabiting Partners.

	Women				Men			
	Living Alone		Cohabiting With Partner		Living Alone		Cohabiting With Partner	
<i>Mobility for the first job (ref. staying at the place of study):</i>								
Home-comers	0.01	[0.03]	0.00	[0.04]	0.01	[0.04]	0.04	[0.05]
Short-distance mobility	0.12***	[0.03]	-0.00	[0.03]	0.04	[0.04]	0.03	[0.04]
Long-distance mobility	0.04	[0.03]	-0.01	[0.04]	0.01	[0.04]	0.14***	[0.04]
Median income level (std.)	0.07**	[0.02]	0.05*	[0.02]	0.06*	[0.02]	0.08***	[0.02]
<i>Interaction between mobility and median income level:</i>								
Home-comers # median income level	-0.08*	[0.03]	0.00	[0.03]	0.00	[0.03]	-0.09+	[0.05]
Short-distance mobility # median income level	-0.03	[0.04]	0.01	[0.03]	-0.02	[0.03]	-0.06	[0.05]
Long-distance mobility # median income level	-0.05+	[0.03]	-0.01	[0.03]	-0.05	[0.03]	-0.10*	[0.04]
<i>Individual controls</i>								
Status expectations (std.)	0.03*	[0.02]	0.07***	[0.02]	0.04**	[0.01]	0.05***	[0.01]
Final grade (std.)	0.03+	[0.01]	0.01	[0.02]	0.04**	[0.02]	0.03	[0.02]
Field of study (ref. arts and humanities):								
Economics	0.07+	[0.04]	0.14***	[0.04]	0.24***	[0.06]	0.19**	[0.06]
Sciences	0.12***	[0.03]	0.17***	[0.04]	0.28***	[0.05]	0.21***	[0.06]
Teaching	0.18***	[0.04]	0.14**	[0.05]	0.27***	[0.07]	0.18*	[0.08]
Personality (Big 5)								
Extraversion (std.)	0.00	[0.01]	0.03*	[0.01]	0.03*	[0.01]	0.01	[0.02]
Agreeableness (std.)	-0.00	[0.01]	-0.01	[0.01]	0.00	[0.01]	0.00	[0.02]
Conscientiousness (std.)	0.01	[0.01]	0.02	[0.01]	0.03*	[0.02]	0.02	[0.02]
Neuroticism (std.)	-0.00	[0.01]	0.00	[0.02]	0.01	[0.01]	0.00	[0.02]
Openness to experience (std.)	-0.01	[0.01]	-0.00	[0.01]	0.01	[0.01]	-0.02	[0.02]
Age at graduation (std.)	0.04***	[0.01]	0.02	[0.01]	0.06***	[0.02]	0.04**	[0.02]
Study degree (ref. no degree):								
BA or equivalent	0.18*	[0.08]	0.03	[0.08]	0.17*	[0.08]	0.22*	[0.10]
MA or equivalent	0.25**	[0.08]	0.15*	[0.09]	0.21**	[0.08]	0.18*	[0.11]
Children in the household (ref. no children)	0.00	[0.10]	-0.05	[0.05]	0.08	[0.13]	0.01	[0.05]
Migration background (ref. no migration background)	0.05	[0.04]	0.06	[0.04]	-0.02	[0.04]	0.03	[0.05]
Parents' socioeconomic background (std.)	0.03*	[0.01]	0.01	[0.01]	-0.00	[0.02]	0.03+	[0.02]
Teacher oversampling (ref. not part of the oversampling)	-0.02	[0.04]	0.04	[0.05]	0.06	[0.08]	-0.08	[0.08]
<i>Regional controls</i>								
Size of service sector in the study region (std.)	-0.03*	[0.01]	-0.02	[0.02]	-0.01	[0.01]	-0.01	[0.02]
Population size in the study region (std.)	-0.01	[0.01]	-0.00	[0.01]	-0.01	[0.01]	-0.01	[0.02]
<i>Entropy balancing weights</i>								
N	✓		✓		✓		✓	
	1,596		1,261		1,125		688	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A7.20. Effect Heterogeneity by the Share of Service Sector Occupations in the Study Region: Regression of Log. Hourly Wages on Mobility After Graduation by Gender and Cohabiting Partners.

	Women				Men			
	Living Alone		Cohabiting With Partner		Living Alone		Cohabiting With Partner	
<i>Mobility for the first job (ref. staying at the place of study):</i>								
Home-comers	-0.00	[0.03]	-0.00	[0.04]	0.02	[0.04]	0.05	[0.05]
Short-distance mobility	0.11***	[0.03]	0.00	[0.03]	0.03	[0.04]	0.03	[0.04]
Long-distance mobility	0.04	[0.03]	-0.00	[0.04]	0.01	[0.04]	0.16***	[0.05]
Size of service sector (std.)	-0.05*	[0.02]	-0.00	[0.03]	0.00	[0.02]	0.04	[0.03]
<i>Interaction between mobility and size of service sector in the study region:</i>								
Home-comers # size of service sector	0.00	[0.04]	-0.05	[0.04]	-0.00	[0.04]	-0.05	[0.05]
Short-distance mobility # size of service sector	0.04	[0.03]	-0.02	[0.04]	-0.03	[0.04]	-0.05	[0.04]
Long-distance mobility # size of service sector	0.03	[0.03]	-0.02	[0.05]	-0.03	[0.03]	-0.09*	[0.04]
<i>Individual controls</i>								
Status expectations (std.)	0.03*	[0.02]	0.07***	[0.02]	0.04**	[0.01]	0.05***	[0.01]
Final grade (std.)	0.02*	[0.01]	0.01	[0.02]	0.04**	[0.02]	0.03	[0.02]
Field of study (ref. arts and humanities):								
Economics	0.07*	[0.04]	0.15***	[0.04]	0.24***	[0.06]	0.18**	[0.07]
Sciences	0.13***	[0.03]	0.17***	[0.04]	0.28***	[0.05]	0.21***	[0.06]
Teaching	0.17***	[0.04]	0.14**	[0.05]	0.26***	[0.07]	0.19*	[0.08]
Personality (Big 5)								
Extraversion (std.)	0.00	[0.01]	0.03*	[0.01]	0.03*	[0.01]	0.01	[0.02]
Agreeableness (std.)	-0.00	[0.01]	-0.01	[0.01]	-0.00	[0.01]	0.01	[0.02]
Conscientiousness (std.)	0.01	[0.01]	0.01	[0.01]	0.03*	[0.02]	0.01	[0.02]
Neuroticism (std.)	-0.00	[0.01]	0.00	[0.02]	0.01	[0.01]	0.00	[0.02]
Openness to experience (std.)	-0.01	[0.01]	-0.00	[0.01]	0.01	[0.01]	-0.03	[0.02]
Age at graduation (std.)	0.05***	[0.01]	0.02	[0.01]	0.06***	[0.02]	0.04*	[0.02]
Study degree (ref. no degree):								
BA or equivalent	0.18*	[0.08]	0.03	[0.08]	0.16*	[0.08]	0.23*	[0.10]
MA or equivalent	0.25**	[0.08]	0.15*	[0.09]	0.21**	[0.08]	0.19*	[0.10]
Children in the household (ref. no children)	0.01	[0.10]	-0.05	[0.05]	0.07	[0.13]	0.01	[0.05]
Migration background (ref. no migration background)	0.06	[0.04]	0.06	[0.04]	-0.02	[0.04]	0.03	[0.05]
Parents' socioeconomic background (std.)	0.03*	[0.01]	0.01	[0.01]	-0.00	[0.02]	0.03*	[0.02]
Teacher oversampling (ref. not part of the oversampling)	-0.02	[0.04]	0.04	[0.05]	0.07	[0.08]	-0.08	[0.08]
<i>Regional controls</i>								
Median income level of the study region (std.)	0.04**	[0.01]	0.06**	[0.02]	0.04*	[0.02]	0.03	[0.02]
Population size in the study region (std.)	-0.01	[0.01]	-0.00	[0.01]	-0.01	[0.01]	-0.01	[0.02]
<i>Entropy balancing weights</i>								
N	1,596		1,261		1,125		688	

Note. Standard errors in brackets. Data sources: NEPS-SC5 17-0-0; BBSR – INKAR Database. 20 Imputations.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix

Supplementary Materials for Study 3

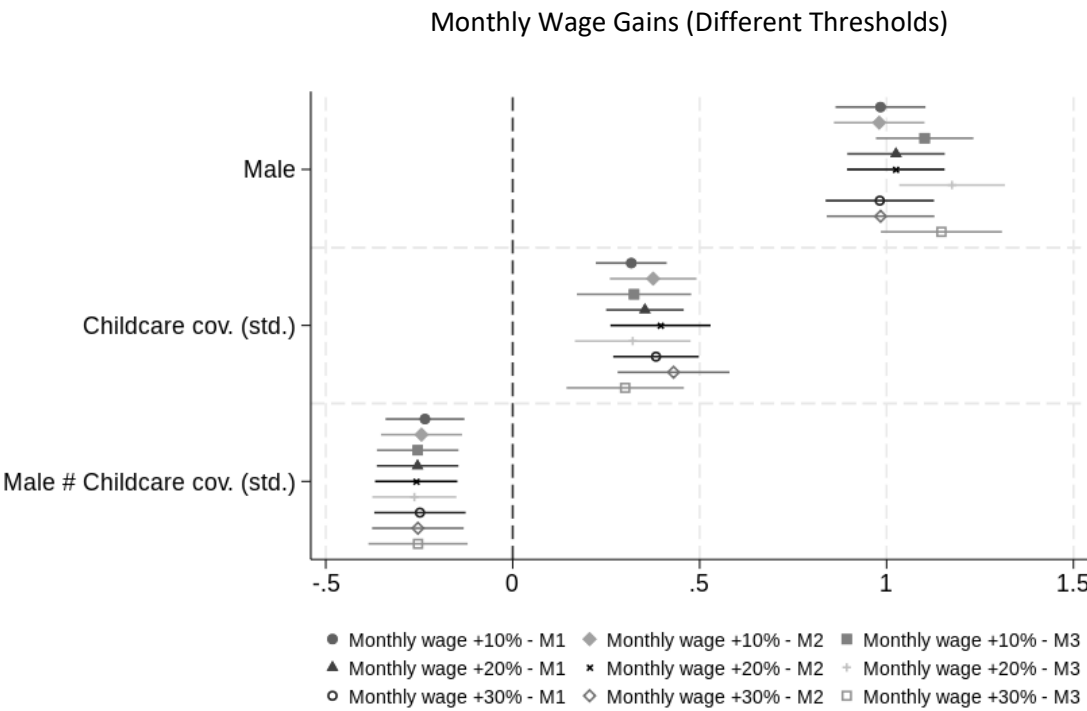


Figure A8.1. Robustness Check on Career Advancements Measured by Monthly Wage Gains Using Different Thresholds.

Note. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

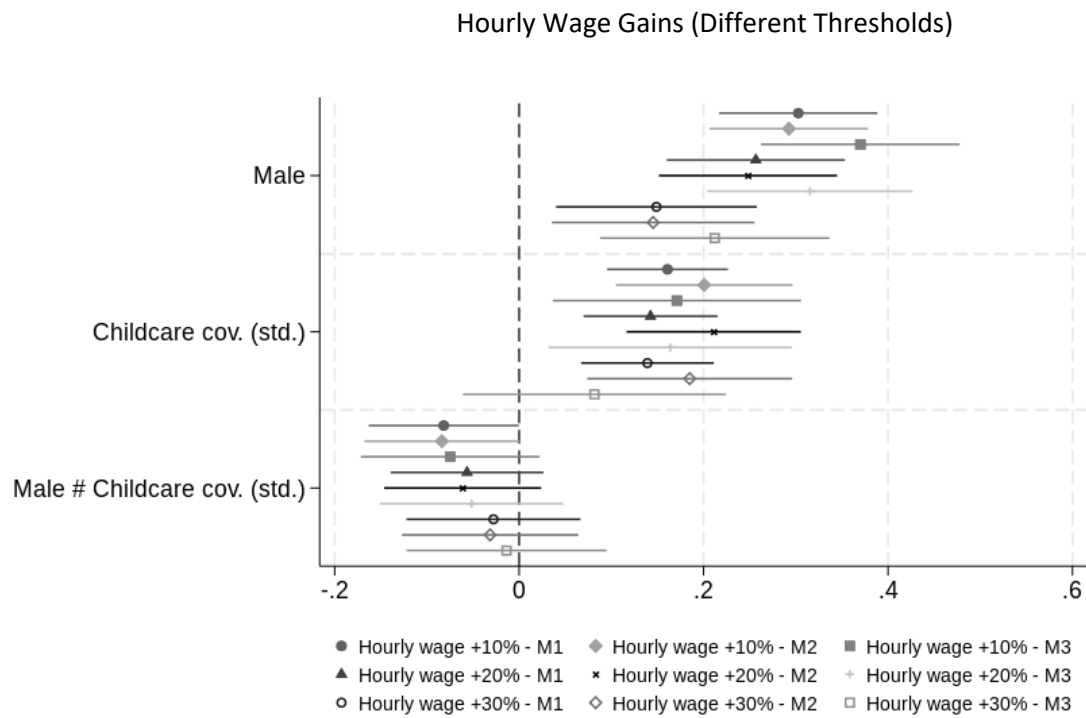


Figure A8.2. Robustness Check on Career Advancements Measured by Hourly Wage Gains Using Different Thresholds.

Note. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.



Figure A8.3. Robustness Check on Career Advancements Measured by Absolute Monthly Wage Gains Using Different Thresholds.

Note. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

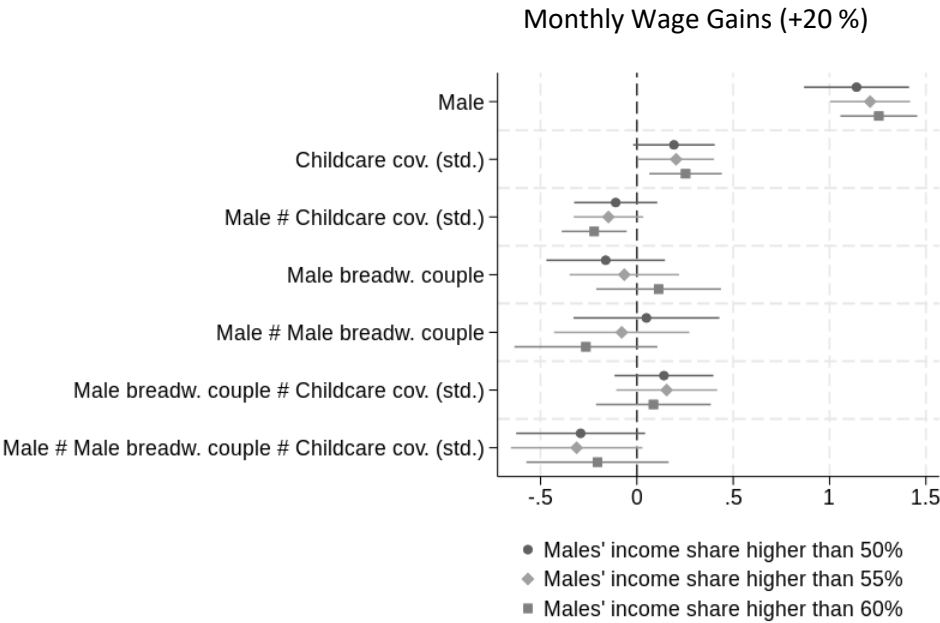


Figure A8.4. Robustness Check on the Moderating Role of Couples' Division of Labor for Monthly Wage Gains Using Different Thresholds for Male-Breadwinner Households.

Note. Models include regional and individual controls. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

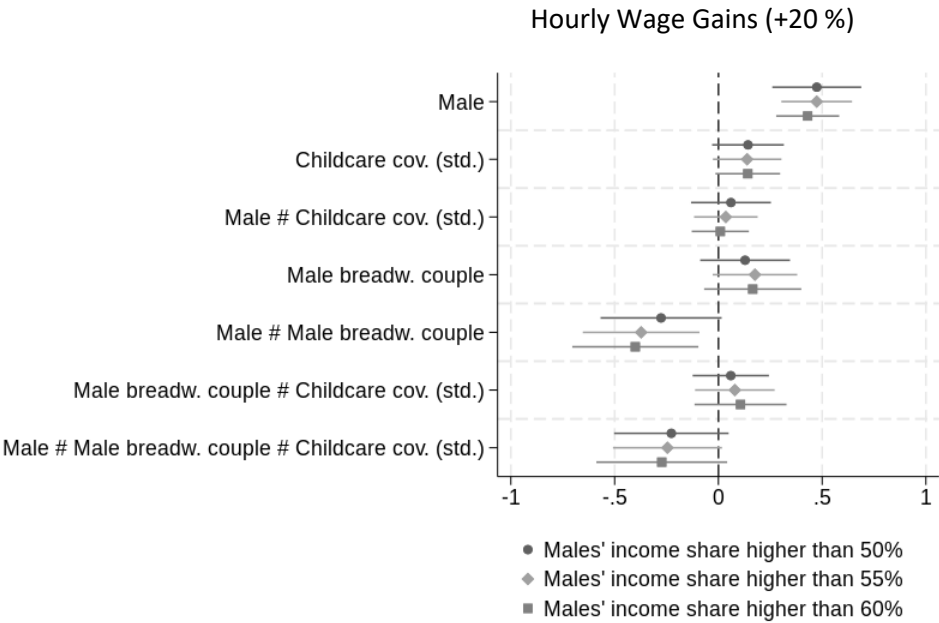


Figure A8.5. Robustness Check on the Moderating Role of Couples' Division of Labor for Hourly Wage Gains Using Different Thresholds for Male-Breadwinner Households.

Note. Models include regional and individual controls. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

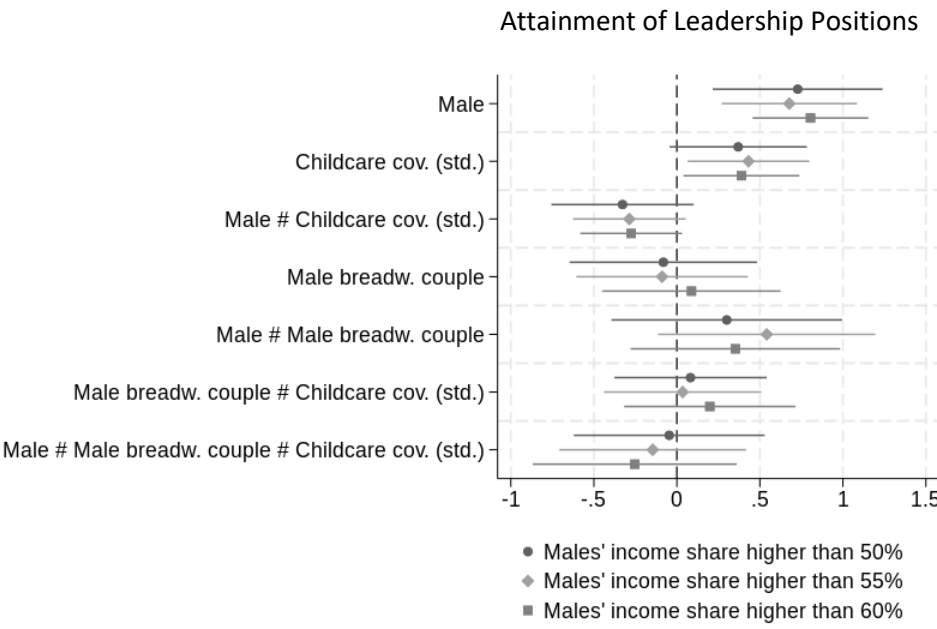


Figure A8.6. Robustness Check on the Moderating Role of Couples’ Division of Labor for Leadership Positions Using Different Thresholds for Male-Breadwinner Households.

Note. Models include regional and individual controls. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

Table A8.1. Inclusion Criteria and Sample Reduction.

Variable	<i>N(deleted cases)</i>	<i>N(remaining cases)</i>
No childbirth reported between 2006 and 2019	65,645	12,658
Age at first parenthood not between 18 and 45	1,638	11,020
Never participated in the labor force	3,275	7,745
First available employment information before the age of 15 or after the age of 50	271	7,474
No other children (below 13) in the household before entering parenthood	76	7,398
No survey participation before or after entering parenthood	4,999	2,399
More than two adults in the household	1	2,398

Note. Data source: GSOEP v38.1 (2006-2021).

Table A8.2. Overview of Incomplete and Imputed Data.

Variable	<i>N</i> (complete)	<i>N</i> (imputed)	<i>N</i> (total)
Time until attaining 20% monthly wage gain	1,813	585	2,398
Time until attaining 20% hourly wage gain	1,805	593	2,398
Time until attaining a leadership position	1,832	566	1,934 ^a
Type of work	1,894	504	2,398
Hours worked	2,196	202	2,398
Employment status	1,894	504	2,398
Health status	1,893	505	2,398
Partner	2,357	41	2,398
Educational background	2,383	15	2,398

Note. Data source: GSOEP v38.1 (2006-2021).

^a Individuals who attained a leadership position prior to entering parenthood were not included.

Table A8.3. Cox Regression of the Time From Entering Parenthood Until Attaining a 20% Monthly Wage Gain on Local Public Childcare Coverage and Parents' Gender.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Male	1.00*** [0.07]	1.00*** [0.07]	1.15*** [0.08]	1.03*** [0.07]	1.02*** [0.07]	1.18*** [0.07]
Childcare coverage (std.)	0.20*** [0.04]	0.23*** [0.06]	0.16* [0.07]	0.35*** [0.05]	0.40*** [0.07]	0.32*** [0.08]
Male # Childcare coverage (std.)				-0.25*** [0.06]	-0.26*** [0.06]	-0.26*** [0.06]
<i>Regional controls:</i>						
Unemployment rate (std.)		-0.01 [0.07]	0.15* [0.06]		-0.01 [0.07]	0.15* [0.07]
GDP per capita (std.)		-0.04 [0.05]	-0.03 [0.07]		-0.04 [0.06]	-0.03 [0.07]
Share of large companies (std.)		0.05 [0.05]	0.04 [0.05]		0.06 [0.05]	0.03 [0.05]
Population density (std.)		-0.15** [0.05]	-0.11 [0.07]		-0.15** [0.06]	-0.11+ [0.07]
Share of conservative voters (std.)		-0.23*** [0.06]	-0.06 [0.06]		-0.23*** [0.06]	-0.06 [0.06]
East Germany (ref. West)		-0.33* [0.16]	-0.21 [0.16]		-0.35* [0.16]	-0.22 [0.16]
<i>Individual controls:</i>						
Educational background (ref. low)						
Medium education			0.12 [0.09]			0.10 [0.10]
High education			0.28* [0.11]			0.26* [0.11]
Migration background (ref. no migration background)			-0.04 [0.09]			-0.03 [0.09]
Type of work (ref. high-skilled white-collar)						
Low-skilled white-collar			-0.04 [0.11]			-0.05 [0.11]
High-skilled blue-collar			-0.02 [0.13]			-0.02 [0.13]
Low-skilled blue-collar			-0.04 [0.17]			-0.06 [0.17]
Labor force experience ^a			0.28*** [0.04]			0.29*** [0.04]
Employed ^a			0.23 [0.19]			0.22 [0.19]
Hours worked ^a			0.03 [0.05]			0.02 [0.05]
Health status: good ^a			-0.12 [0.09]			-0.11 [0.09]
Age ^b			-0.18*** [0.05]			-0.18*** [0.04]
Relocation ^c			0.21* [0.08]			0.19* [0.08]
Partner ^a			-0.21+ [0.11]			-0.18 [0.11]
Year of childbirth (ref. 2006):						
2007			0.45* [0.19]			0.44* [0.19]
2008			0.48* [0.19]			0.47* [0.20]
2009			0.09 [0.19]			0.06 [0.19]
2010			-0.60* [0.24]			-0.62** [0.24]
2011			0.22 [0.22]			0.20 [0.22]
2012			0.21 [0.23]			0.20 [0.23]
2013			0.31 [0.21]			0.30 [0.21]
2014			0.53* [0.22]			0.52* [0.22]
2015			0.34 [0.26]			0.34 [0.26]
2016			0.45* [0.23]			0.45* [0.23]
2017			0.51* [0.22]			0.52* [0.22]
2018			1.03*** [0.24]			1.03*** [0.23]
2019			1.43*** [0.29]			1.43*** [0.29]
Person-months	127,962	127,962	127,962	127,962	127,962	127,962
N(observations)	3,212	3,212	3,212	3,212	3,212	3,212
N(persons)	2,398	2,398	2,398	2,398	2,398	2,398
N(events)	819	819	819	819	819	819

Note. Cluster-robust standard errors in brackets. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

^a Measured prior to entering parenthood. ^b Measured when entering parenthood. ^c Measured in the period of two years prior to entering parenthood.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A8.4. Cox Regression of the Time From Entering Parenthood Until Attaining a 20% Hourly Wage Gain on Local Public Childcare Coverage and Parents' Gender.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Male	0.26*** [0.05]	0.25*** [0.05]	0.32*** [0.06]	0.26*** [0.05]	0.25*** [0.05]	0.32*** [0.06]
Childcare coverage (std.)	0.12*** [0.03]	0.18*** [0.05]	0.14* [0.06]	0.14*** [0.04]	0.21*** [0.05]	0.16* [0.07]
Male # Childcare coverage (std.)				-0.06 [0.04]	-0.06 [0.04]	-0.05 [0.05]
<i>Regional controls:</i>						
Unemployment rate (std.)		-0.09 [0.06]	0.01 [0.06]		-0.09 [0.06]	0.01 [0.06]
GDP per capita (std.)		-0.03 [0.05]	-0.05 [0.06]		-0.03 [0.05]	-0.04 [0.06]
Share of large companies (std.)		0.02 [0.05]	0.03 [0.05]		0.02 [0.05]	0.03 [0.05]
Population density (std.)		-0.10* [0.04]	-0.06 [0.05]		-0.10* [0.04]	-0.06 [0.05]
Share of conservative voters (std.)		-0.21*** [0.05]	-0.10* [0.06]		-0.21*** [0.05]	-0.10* [0.06]
East Germany (ref. West)		-0.34* [0.14]	-0.28* [0.15]		-0.35* [0.14]	-0.28* [0.15]
<i>Individual controls:</i>						
Educational background (ref. low)						
Medium education			0.06 [0.08]			0.05 [0.08]
High education			0.19* [0.09]			0.19* [0.09]
Migration background (ref. no migration background)			-0.09 [0.08]			-0.09 [0.08]
Type of work (ref. high-skilled white-collar)						
Low-skilled white-collar			-0.07 [0.10]			-0.07 [0.10]
High-skilled blue-collar			-0.16 [0.12]			-0.16 [0.12]
Low-skilled blue-collar			-0.07 [0.16]			-0.07 [0.16]
Labor force experience ^a			0.28*** [0.04]			0.28*** [0.04]
Employed ^a			0.21 [0.18]			0.21 [0.18]
Hours worked ^a			0.28*** [0.05]			0.28*** [0.05]
Health status: good ^a			-0.09 [0.08]			-0.09 [0.08]
Age ^b			-0.17*** [0.04]			-0.17*** [0.04]
Relocation ^c			0.16* [0.08]			0.16* [0.07]
Partner ^a			-0.05 [0.10]			-0.04 [0.10]
Year of childbirth (ref. 2006):						
2007			0.35* [0.17]			0.35* [0.17]
2008			0.38* [0.17]			0.37* [0.17]
2009			0.16 [0.18]			0.15 [0.19]
2010			-0.94*** [0.23]			-0.94*** [0.23]
2011			0.01 [0.19]			0.01 [0.19]
2012			0.11 [0.21]			0.11 [0.21]
2013			0.22 [0.19]			0.21 [0.19]
2014			0.48** [0.18]			0.48** [0.18]
2015			0.31 [0.21]			0.30 [0.21]
2016			0.32 [0.20]			0.31 [0.20]
2017			0.27 [0.20]			0.27 [0.20]
2018			0.74*** [0.22]			0.74*** [0.22]
2019			1.15*** [0.24]			1.15*** [0.24]
Person-months	116,328	116,328	116,328	116,328	116,328	116,328
N(observations)	3,132	3,132	3,132	3,132	3,132	3,132
N(persons)	2,398	2,398	2,398	2,398	2,398	2,398
N(events)	1,080	1,080	1,080	1,080	1,080	1,080

Note. Cluster-robust standard errors in brackets. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

^a Measured prior to entering parenthood. ^b Measured when entering parenthood. ^c Measured in the period of two years prior to entering parenthood.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A8.5. Cox Regression of the Time From Entering Parenthood Until Attaining a Leadership Position on Local Public Childcare Coverage and Parents' Gender.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Male	0.97*** [0.13]	0.97*** [0.13]	0.92*** [0.14]	0.99*** [0.12]	0.98*** [0.13]	0.93*** [0.14]
Childcare coverage (std.)	0.16** [0.06]	0.27** [0.10]	0.21 [0.13]	0.32*** [0.08]	0.44*** [0.11]	0.40* [0.15]
Male # Childcare coverage (std.)				-0.25* [0.10]	-0.27* [0.11]	-0.28* [0.11]
<i>Regional controls:</i>						
Unemployment rate (std.)		-0.07 [0.08]	0.04 [0.12]		-0.07 [0.08]	0.05 [0.12]
GDP per capita (std.)		-0.12 [0.08]	-0.11 [0.10]		-0.12 [0.08]	-0.11 [0.10]
Share of large companies (std.)		0.13 [0.09]	0.13 [0.09]		0.13 [0.09]	0.13 [0.09]
Population density (std.)		0.06 [0.08]	0.03 [0.09]		0.06 [0.08]	0.03 [0.09]
Share of conservative voters (std.)		-0.11 [0.10]	-0.02 [0.12]		-0.11 [0.10]	-0.01 [0.12]
East Germany (ref. West)		-0.49 [0.32]	-0.46 [0.35]		-0.51 [0.33]	-0.46 [0.35]
<i>Individual controls:</i>						
Educational background (ref. low)						
Medium education			0.00 [0.18]			-0.02 [0.18]
High education			0.64*** [0.15]			0.63*** [0.15]
Migration background (ref. no migration background)			-0.44* [0.18]			-0.43* [0.18]
Type of work (ref. high-skilled white-collar)						
Low-skilled white-collar			-0.55** [0.19]			-0.56** [0.19]
High-skilled blue-collar			0.00 [0.20]			-0.00 [0.20]
Low-skilled blue-collar			-0.29 [0.28]			-0.28 [0.28]
Labor force experience ^a			-0.04 [0.08]			-0.04 [0.08]
Employed ^a			0.04 [0.31]			0.04 [0.31]
Hours worked ^a			0.17* [0.08]			0.16* [0.08]
Health status: good ^a			0.20 [0.17]			0.21 [0.17]
Age ^b			0.04 [0.07]			0.04 [0.07]
Relocation ^c			0.02 [0.14]			0.01 [0.14]
Partner ^a			0.16 [0.22]			0.20 [0.23]
Year of childbirth (ref. 2006):						
2007			0.52+ [0.28]			0.52+ [0.28]
2008			0.30 [0.35]			0.29 [0.35]
2009			0.47 [0.33]			0.46 [0.33]
2010			0.01 [0.32]			-0.01 [0.32]
2011			0.19 [0.37]			0.16 [0.38]
2012			0.20 [0.37]			0.15 [0.37]
2013			0.42 [0.37]			0.41 [0.37]
2014			0.11 [0.45]			0.08 [0.45]
2015			0.46 [0.40]			0.45 [0.40]
2016			0.70+ [0.42]			0.70+ [0.42]
2017			0.42 [0.44]			0.41 [0.44]
2018			0.50 [0.45]			0.52 [0.45]
2019			0.92+ [0.50]			0.92+ [0.50]
Person-months	116,811	116,811	116,811	116,811	116,811	116,811
N(observations)	2,694	2,694	2,694	2,694	2,694	2,694
N(persons)	1,934	1,934	1,934	1,934	1,934	1,934
N(events)	283	283	283	283	283	283

Note. Cluster-robust standard errors in brackets. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

^a Measured prior to entering parenthood. ^b Measured when entering parenthood. ^c Measured in the period of two years prior to entering parenthood.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A8.6. Cox Regression of the Time From Entering Parenthood Until Attaining a 20% Monthly Wage Gain on Local Public Childcare Coverage, Parents' Gender, and Couples' Division of Labor, Analyses With Couples Only.

	Model 1		Model 2		Model 3	
Male	0.98***	[0.11]	0.99***	[0.11]	1.21***	[0.11]
Childcare coverage (std.)	0.31***	[0.08]	0.32***	[0.09]	0.20*	[0.10]
Male-breadwinner couple	-0.15	[0.15]	-0.14	[0.15]	-0.07	[0.14]
<i>Two-way interactions:</i>						
Male # Childcare coverage (std.)	-0.17*	[0.09]	-0.18*	[0.09]	-0.15	[0.09]
Male # Male-breadwinner couple	0.10	[0.21]	0.10	[0.20]	-0.08	[0.18]
Childcare coverage (std.) # Male-breadwinner couple	0.14	[0.13]	0.16	[0.13]	0.15	[0.13]
<i>Three-way interaction:</i>						
Male # Childcare coverage (std.) # Male-breadwinner couple	-0.23	[0.17]	-0.23	[0.17]	-0.31*	[0.17]
<i>Regional controls:</i>						
Unemployment rate (std.)			-0.01	[0.07]	0.15*	[0.07]
GDP per capita (std.)			-0.02	[0.06]	0.01	[0.09]
Share of large companies (std.)			0.05	[0.06]	0.01	[0.06]
Population density (std.)			-0.16**	[0.06]	-0.12	[0.08]
Share of conservative voters (std.)			-0.24***	[0.06]	-0.10	[0.07]
East Germany (ref. West)			-0.23	[0.18]	0.00	[0.18]
<i>Individual controls:</i>						
Educational background (ref. low)						
Medium education					0.02	[0.10]
High education					0.18	[0.12]
Migration background (ref. no migration background)					-0.03	[0.10]
Type of work (ref. high-skilled white-collar)						
Low-skilled white-collar					-0.09	[0.13]
High-skilled blue-collar					0.01	[0.14]
Low-skilled blue-collar					-0.11	[0.19]
Labor force experience ^a					0.31***	[0.04]
Employed ^a					0.22	[0.20]
Hours worked ^a					0.03	[0.06]
Health status: good ^a					-0.10	[0.10]
Age ^b					-0.17***	[0.05]
Relocation ^c					0.22*	[0.09]
Partner ^a					-0.14	[0.14]
Year of childbirth (ref. 2006):						
2007					0.48*	[0.21]
2008					0.48*	[0.21]
2009					0.04	[0.21]
2010					-0.74**	[0.28]
2011					0.32	[0.24]
2012					0.31	[0.25]
2013					0.38*	[0.22]
2014					0.69**	[0.24]
2015					0.47*	[0.27]
2016					0.67**	[0.24]
2017					0.59*	[0.24]
2018					1.17***	[0.27]
2019					1.52***	[0.33]
Person-months	112,420		112,420		112,420	
N(observations)	2,793		2,793		2,793	
N(persons)	2,055		2,092		2,092	
N(events)	719		719		719	

Note. Cluster-robust standard errors in brackets. Data sources: GSOEP v38.1 (2006–2021); BBSR – INKAR Database. 20 Imputations.

^a Measured prior to entering parenthood. ^b Measured when entering parenthood. ^c Measured in the period of two years prior to entering parenthood.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A8.7. Cox Regression of the Time From Entering Parenthood Until Attaining a 20% Hourly Wage Gain on Local Public Childcare Coverage, Parents' Gender, and Couples' Division of Labor, Analyses With Couples Only.

	Model 1		Model 2		Model 3	
Male	0.25*	[0.10]	0.25*	[0.10]	0.47***	[0.09]
Childcare coverage (std.)	0.14*	[0.06]	0.19**	[0.07]	0.14+	[0.08]
Male-breadwinner couple	0.00	[0.12]	0.01	[0.12]	0.18+	[0.10]
<i>Two-way interactions:</i>						
Male # Childcare coverage (std.)	-0.01	[0.07]	-0.02	[0.08]	0.04	[0.08]
Male # Male-breadwinner couple	-0.02	[0.18]	-0.03	[0.18]	-0.37**	[0.14]
Childcare coverage (std.) # Male-breadwinner couple	0.04	[0.10]	0.06	[0.10]	0.08	[0.10]
<i>Three-way interaction:</i>						
Male # Childcare coverage (std.) # Male-breadwinner couple	-0.11	[0.13]	-0.12	[0.14]	-0.25+	[0.13]
<i>Regional controls:</i>						
Unemployment rate (std.)			-0.09	[0.06]	0.00	[0.07]
GDP per capita (std.)			-0.02	[0.05]	-0.03	[0.07]
Share of large companies (std.)			0.03	[0.05]	0.04	[0.06]
Population density (std.)			-0.09*	[0.05]	-0.05	[0.06]
Share of conservative voters (std.)			-0.21***	[0.06]	-0.11+	[0.06]
East Germany (ref. West)			-0.30*	[0.15]	-0.17	[0.16]
<i>Individual controls:</i>						
Educational background (ref. low)						
Medium education					0.01	[0.09]
High education					0.16	[0.10]
Migration background (ref. no migration background)					-0.12	[0.09]
Type of work (ref. high-skilled white-collar)						
Low-skilled white-collar					-0.12	[0.11]
High-skilled blue-collar					-0.14	[0.13]
Low-skilled blue-collar					-0.10	[0.17]
Labor force experience ^a					0.29***	[0.04]
Employed ^a					0.16	[0.19]
Hours worked ^a					0.29***	[0.05]
Health status: good ^a					-0.07	[0.08]
Age ^b					-0.17***	[0.05]
Relocation ^c					0.15+	[0.08]
Partner ^a					-0.07	[0.12]
Year of childbirth (ref. 2006):						
2007					0.37+	[0.19]
2008					0.36*	[0.18]
2009					0.10	[0.20]
2010					-1.08***	[0.27]
2011					-0.00	[0.20]
2012					0.12	[0.22]
2013					0.21	[0.20]
2014					0.52**	[0.19]
2015					0.24	[0.23]
2016					0.30	[0.21]
2017					0.22	[0.21]
2018					0.76**	[0.24]
2019					1.10***	[0.27]
Person-months	102,404		102,404		102,404	
N(observations)	2,717		2,717		2,717	
N(persons)	2,055		2,055		2,055	
N(events)	942		942		942	

Note. Cluster-robust standard errors in brackets. Data sources: GSOEP v38.1 (2006-2021); BBSR – INKAR Database. 20 Imputations.

^a Measured prior to entering parenthood. ^b Measured when entering parenthood. ^c Measured in the period of two years prior to entering parenthood.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A8.8. Cox Regression of the Time From Entering Parenthood Until Attaining a Leadership Position on Local Public Childcare Coverage, Parents' Gender, and Couples' Division of Labor, Analyses With Couples Only.

	Model 1		Model 2		Model 3	
Male	0.60**	[0.19]	0.59**	[0.19]	0.68**	[0.21]
Childcare coverage (std.)	0.37***	[0.11]	0.45**	[0.15]	0.43*	[0.19]
Male-breadwinner couple	-0.32	[0.25]	-0.29	[0.25]	-0.09	[0.26]
<i>Two-way interactions:</i>						
Male # Childcare coverage (std.)	-0.23	[0.15]	-0.26	[0.16]	-0.29*	[0.17]
Male # Male-breadwinner couple	0.80**	[0.30]	0.80**	[0.31]	0.54	[0.33]
Childcare coverage (std.) # Male-breadwinner couple	0.04	[0.21]	0.07	[0.22]	0.03	[0.24]
<i>Three-way interaction:</i>						
Male # Childcare coverage (std.) # Male-breadwinner couple	-0.15	[0.25]	-0.14	[0.26]	-0.15	[0.29]
<i>Regional controls:</i>						
Unemployment rate (std.)			-0.07	[0.10]	0.02	[0.13]
GDP per capita (std.)			-0.16	[0.10]	-0.16	[0.12]
Share of large companies (std.)			0.17*	[0.10]	0.17*	[0.10]
Population density (std.)			0.12	[0.09]	0.08	[0.10]
Share of conservative voters (std.)			-0.08	[0.11]	0.01	[0.13]
East Germany (ref. West)			-0.38	[0.36]	-0.35	[0.39]
<i>Individual controls:</i>						
Educational background (ref. low)						
Medium education					-0.05	[0.19]
High education					0.63***	[0.16]
Migration background (ref. no migration background)					-0.45*	[0.19]
Type of work (ref. high-skilled white-collar)						
Low-skilled white-collar					-0.45*	[0.22]
High-skilled blue-collar					0.04	[0.21]
Low-skilled blue-collar					-0.13	[0.29]
Labor force experience ^a					-0.05	[0.08]
Employed ^a					0.03	[0.33]
Hours worked ^a					0.16*	[0.10]
Health status: good ^a					0.18	[0.18]
Age ^b					0.06	[0.08]
Relocation ^c					0.05	[0.15]
Partner ^a					0.39	[0.33]
Year of childbirth (ref. 2006):						
2007					0.50*	[0.30]
2008					0.12	[0.37]
2009					0.44	[0.35]
2010					-0.03	[0.33]
2011					0.13	[0.39]
2012					0.05	[0.39]
2013					0.38	[0.41]
2014					-0.01	[0.49]
2015					0.41	[0.42]
2016					0.54	[0.46]
2017					0.21	[0.48]
2018					0.60	[0.45]
2019					0.57	[0.57]
Person-months	103,302		103,302		103,302	
N(observations)	2,340		2,340		2,340	
N(persons)	1,652		1,652		1,652	
N(events)	245		245		245	

Note. Cluster-robust standard errors in brackets. Data sources: GSOEP v38.1 (2006–2021); BBSR – INKAR Database. 20 Imputations.

^a Measured prior to entering parenthood. ^b Measured when entering parenthood. ^c Measured in the period of two years prior to entering parenthood.

* $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$