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**Social and Gender Inequalities in Western Europe:
Examining How Women's Disadvantages are
Shaped by the Interplay between Family Dynamics
and Social Origin**

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Introduction

The main analytical tool of social stratification research, Origin-Education-Destination triangle (Blau & Duncan, 1967), was developed in the late 1960s characterised by the prevalence of the male breadwinner model and reproductive behaviours. However, since then, Western European societies have undergone substantial social, economic, and demographic changes making researchers extend the analytical framework. The reduction of fertility levels, greater couple instability, rise in cohabitation and divorce resulted in increasing heterogeneity in the first element of the triangle, the social background of origin, and in growing attention to the processes occurring within the family. The expansion of educational participation and the reversal of the gender gap in college completion led to the greater importance of the horizontal dimension of school inequality, i.e., the choice of different tracks and fields of study. The increase in female labour market participation affected the change in the definition of social origin and resulted in a greater role of gender. All these processes require inequality scholars to consider the increasing heterogeneity of populations and the complexity of the mechanisms underpinning the intergenerational reproduction of social inequality.

One of the most important educational trends in recent years in western countries has been the reversal of the gender gap in educational attainment. While in the past men have always received more education than women, nowadays females surpass males in terms of participation and success in higher education. However, gender imbalance with respect to the horizontal dimension of educational systems, that is fields of study or tracks, remains substantial. Women continue to be underrepresented in engineering, mathematics, and computer science, and to a lesser degree in the natural sciences. At the same time, they are likely to be overrepresented in education, humanities, social sciences, law, and health fields. This pattern of choice has crucial implications for labour market inequalities since humanities and social sciences lead to less favourable prospects in terms of unemployment rates and earnings compared to engineering and computer science.

The family represents an important socializing environment that affects educational choices. While it is well established that parental socioeconomic background and

investment, as well as genetic inheritance, play a crucial role in determining opportunity structures, and, as a consequence, the educational and socioeconomic trajectories that are followed in life, less is known about the role of siblings and sibling group composition. Moreover, despite the fact that siblings share the same home and partially the same genes, their outcomes vary substantially (Björklund & Jäntti 2012). Part of this variation results from divergent experiences within the family that are linked to differences in individual characteristics, such as gender and birth order. Cultural beliefs about gender roles reproduced through socialization within the family are likely to make men and women feel entitled to choose gender-typical fields. As for birth order, the evidence shows that parents tend to invest more resources in first-born children, who result having a higher grade point average in school, higher completed educational attainment, and a higher probability of applying to, and graduating from, medicine and engineering programs at university, compared to later-born children (Barclay, 2015; Barclay et al., 2017; Bjerkedal et al., 2007; Black et al., 2005).

Another contrasting evidence with respect to women's success in educational attainment is their systematic disadvantage in the labour market in terms of employment likelihood, occupational attainment, and earnings with respect to men. The key factor of such inequality is embedded within a family context and related to the transition to parenthood pulling men and women in opposite directions. Whereas men's labour supply remains stable or increases upon transition to parenthood, women experience a notable decrease in employment and work hours (Damaske & Frech, 2016; Killewald & Zhou, 2019; Lundberg & Rose, 2002; Musick et al. 2020). Reductions in mothers' cumulative work experience due to employment interruptions, in turn, account for a significant part of both the motherhood wage penalty and gender wage gap and have long-term implications for their careers (Blau & Kahn, 2017; Budig & England, 2001; Gangl & Ziefle, 2009; Bertrand et al., 2010).

In contrast to considerable attention paid by the literature to the role of parenthood, the process that remains less explored is family migration (Cooke et al., 2009). Although single women, like single men, were found to benefit from geographical mobility by taking advantage of better job opportunities offered in locations different from their place of origin or current residence (e.g., Geist & McManus, 2012; Jacobsen & Levin, 1997; Maxwell, 1988), partnered or family migration was shown to result in unfavourable

labour market outcomes for females who are likely to find themselves in a position of a “tied mover” relocating in response to their partners’ move (Cooke, 2003; Jacobsen & Levin, 2000). Despite the existence of this evidence, the analysis of tied migration phenomenon has been limited by the scarcity of data that capture information on residential, family, and employment histories both in the country of origin and in the host society. The planning of family migration strategies typically occurs before migration, and this critical period of decision-making involves complex interrelationships between migration decisions and other biographical events (Mulder & Wagner, 1993; Impicciatore & Panichella, 2019). However, cross-sectional data collected in the host societies often do not capture these pre-migration dynamics, which makes it difficult to test the tied migration hypothesis.

Another aspect of gender inequality studies that remains underexplored is the interplay between the family-of-origin and the family-of-destination factors in shaping women’s labour market outcomes. While several studies have examined how women’s educational level (e.g., Steiber et al, 2016; Evertsson et al., 2009) and their partners’ resources (Bernardi, 1999; Vandecasteele & Esche, 2015) affect their employment opportunities, no research (to the best knowledge of the author) has been done on the impact of family background, net of education. The importance of addressing this question is related to the fact that the direct effect of social origin might create a cumulative disadvantage for mothers from less privileged backgrounds or compensate for the motherhood penalty for women from better-off origins. The direct effect of social origin on mothers’ labour market outcomes might operate through access to social networks, employers’ favouritism, inheritance of family business, or financial resources. Moreover, the effect of social origin might vary depending on the factors related to the family of destination, such as the partner’s resources (his education and/or occupational status). On top of the individual-level factors, the employment of mothers is determined by the macro context characterised by the country’s family policies, gender norms, and labour market structure and regulations. Although there is a large number of studies that investigate cross-country differences in women’s employment (e.g., Pfau-Effinger, 2012; Stier et al, 2001; Fortin, 2005), as well as the studies that model female labour supply based on micro-data in single countries, limited attention has been paid to the variation in the impact of individual factors by national contexts.

Taking into consideration the limitations of existing studies and social, economic, and demographic changes that occurred in western societies, this thesis aims to analyse the role of both family of origin and the family of destination for women's educational and labour market outcomes based on the three studies relying on an extended version of Origin-Education-Destination triangle. In addition, the thesis attempts to uncover the patterns of cumulative advantages/disadvantages with respect to women's employment outcomes. On the one hand, taking a temporal perspective, this work investigates whether married women's employment disadvantage amplified by family migration increases over age. On the other hand, considering the cumulative mechanism as a status-resource interplay, it explores if the interaction of different status characteristics and resources, such as educational level and migration background, motherhood, and social origin, as well as the partner's social standing, results in magnified employment advantages/disadvantages for women that are already advantaged/disadvantaged.

The first chapter outlines the overall theoretical framework of social stratification and gender inequality research and describes the empirical strategy of the thesis. The second chapter is focused on the analysis of educational inequalities, influenced by the environment and the structure (sibling gender composition, their birth order) of the family of origin. The third chapter aims to investigate how the influence of geographical mobility on women's employment differs based on their family and migration backgrounds, and to identify potential patterns of advantage or disadvantage that accumulate throughout their lives. The fourth chapter focuses on the interplay between the family-of-origin (social class of origin) and family-of-destination factors (motherhood, partner's resources) in determining the women's employment outcomes and its heterogeneity across European countries. The final chapter of the thesis provides overall conclusions and suggestions for future research.

Chapter 1

Gender, social origin, and intergenerational transmission of social stratification

1. The intergenerational transmission of social inequality in contemporary societies

Social stratification represents an important area of sociology that studies the distribution of income, wealth, education, health and longevity, status, prestige, and other desired social goods, across groups defined by social classes and occupations, race, gender, immigrant status, or age (Grusky, 2019). This research strand aims to describe the patterns of inequality; uncover its political, social, and economic consequences; analyse how the various dimensions of inequality interact with each other, change over time and the life course, vary across geographical areas, persist across generations, and are affected by various environments and institutions, such as families, schools, neighbourhoods, companies, local and national labour markets, unions and other labour market institutions (Shavit & Blossfeld, 1993; Shavit & Müller, 1998; Breen, 2004).

The main analytical tool of social stratification research, allowing to study the intergenerational reproduction of social inequality and mediating role of education is the so-called origin-education-destination (OED) triangle (Figure 1) (Blau & Duncan, 1967). The first element of this framework, origin (O), usually refers to the social position of the family from which an individual comes measured by the parents' social class or education. However, it should be noted that OED triangle was developed in the late 1960s characterised by the prevalence of the male breadwinner model and reproductive behaviours. Since then, Western European societies have undergone substantial demographic changes accompanied by a shift in values structure. These transformations, as highlighted by the Second Demographic Transition thesis (Lesthaeghe, 2010), include a decline in the incidence of marriages and the number of children, increasing mean age at first parenthood, greater couple instability, rise in cohabitation and divorce, rising female economic activity, as well as more individualistic lifestyle orientations along with a greater prioritization of "higher-order" needs such as self-realization. As a result, social

and demographic characteristics of the families have become more heterogeneous than in previous years, making social stratification researchers extend the meaning of the first element of the triangle, the social origin (O), over and above the cultural and economic resources of the family of origin (Guetto & Panichella, 2019) and pay attention to such characteristics as gender, ethnicity, geographical origin, and family structure.

The second element is education (E) and it is influenced by social origin (OE link), meaning that individuals from advantaged families are more likely not only to have better academic performance (primary effects) but also to achieve higher educational titles (secondary effects). The third element of the triangle, the social destination (D), refers to one's social position which can be expressed by employment opportunities, occupational attainment, social class, or income. The social destination is affected by an individual's educational attainment (ED link) and by his/her origin. The latter effect is exerted in two ways, direct and indirect. The indirect influence operates through education, while the direct effect (OD link) implies that even if individuals have the same levels of education those of them who come from advantaged families, on average, achieve better labour market outcomes.

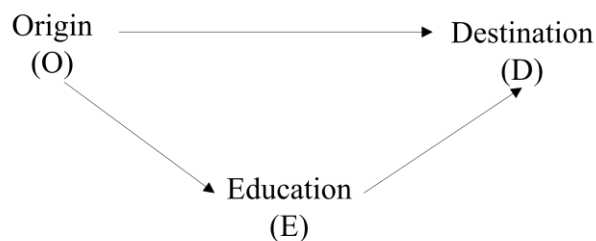


Figure 1 - OED triangle (Blau & Duncan, 1967).

According to modernization theory (Bell, 1976; Blau & Duncan, 1967), as societies industrialize and further develop, the mechanism by which individuals are allocated into occupations should change from ascription to acquisition, that is, ascribed characteristics mentioned above should become less important for obtaining a certain socioeconomic position. In contrast, acquired characteristics, such as occupation-specific knowledge and skills, should become the key determinants of the efficient allocation and selection processes in the labour market. The crucial factor underlying this transition is market

competition among different employers, who are forced to hire the more productive workers in order not to be pushed out of the market by their competitors, and therefore rely on educational titles when screening the potential candidates. More generally, the shift from ascription to achievement in the process of occupational allocation was linked to industrialization and a greater demand for skilled workers; the increase in firm size resulting in gradual bureaucratisation of recruitment and internal promotion processes; geographical mobility and the loss of community bonds; the spread of egalitarian ideologies and cultures (Ganzeboom & Treiman, 2007; Treiman, 1970). Modern societies are, thus, expected to increasingly approach the ideal of an education-based meritocracy, where access to education does not depend on one's social origin, and where educational qualifications are the only factor influencing economic success.

Contrary to the predictions of modernization theory, social reproduction theory argues that the upper classes, by mobilizing their cultural and economic resources, will maintain their privileged position even in the context of mass education. Therefore, inequality of educational opportunities (IEO) is expected to persist or display only trendless fluctuations. Empirical evidence, however, does not support either of the two theories (Barone, 2019). While for the cohorts born in the 1940s and 1950s and schooled in a period of dramatic economic growth, IEOs were reduced in most European countries (e.g., Breen et al, 2009, 2010), for cohorts schooled in the two following decades, the evidence indicated the stability of IEO (e.g., Barone & Ruggera, 2016; Bernardi et al., 2018; Hout & Janus, 2011). Furthermore, it has been shown that the social origin, over and above education, on one's occupational status is stable over time in many advanced countries, and in some of them (Israel and France) it even increases (Bernardi & Ballarino, 2016). Thus, family background remains a strong factor influencing education and further labour market outcomes.

1.1 The mechanisms of educational inequality: primary, secondary, and tertiary effects

Two main mechanisms have been put forward to explain the impact of social origin on education: primary effects and secondary effects (Boudon, 1974; Eriksson & Jonsson, 1996). Primary effects imply that children from upper-class families generally perform better in school due to such factors as intentional parental behaviours and unintentional parental influence through daily interactions, which are all closely interconnected.

Although the research on genetic factors is still in its emerging phase, it is well known that the influence of genes is not so significant unless there is an environment suitable for their activation and development. On the contrary, parental behaviours and influence, either intentional or unintentional, are of great importance for the development of children's skills and abilities (Ermisch et al. 2012). More educated parents on average spend more time with their children (Dotti Sani, 2018), transmit an extended linguistic code (Bernstein, 1971), and have more economic and cultural resources at their disposal that result in more education-specific support.

The differences in parenting styles practiced by families of various backgrounds and their outcomes for children were described by Lareau in her book "Unequal Childhoods. Class, Race and Family Life" (2003). Parents in middle and upper-class families tend to adopt the so-called "concerted cultivation". This parenting style implies constant conversations with children, enrolling them in various after-school activities, such as sports, languages, and music classes, which not only has a positive impact on school performance but also makes children accustomed to communicating with adults who are strangers to their families. Upper-class children, thus, learn how to navigate bureaucracy, challenge authorities, and manage time - skills that are important for future adult life. In contrast, parents in lower-class families spend less time with their children, give them orders rather than listen to their opinions, do not structure their activities, letting them spend their free time playing with other children in the neighbourhood. Under this parenting style, defined as "accomplishment of natural growth", children grow less prepared for school and the labour market, for navigating middle and upper-class societies.

The importance of cultural capital, expressed in a set of cultural codes, modes of conduct, and use of language, for intergenerational transmission of inequality is highlighted by the social reproduction theory (Bourdieu & Passeron, 1977). Children in advantaged families inherit from their parents familiarity with the dominant culture in the society, which, in turn, shapes their "habitus", a system of predispositions, including values and motivations. Owing to this awareness of the dominant culture, upper-class children show better results at school compared to their lower-class counterparts who are not exposed to the intellectual and stimulating family environment. Moreover, disadvantaged children face additional challenges in terms of learning new behaviours,

different from their background, and overcoming the scepticism of their friends or family (Ballarino & Panichella, 2021).

Secondary effects refer to the fact that children from advantaged families reach higher levels of education even if they have the same level of performance as their counterparts with lower social origins. It is important to note that these effects are particularly strong among students with average performance but are limited to those who have high or poor academic achievement (Jackson et al., 2007). This means that among average students those from advantaged families are much more likely to pursue their studies than those from less advantaged backgrounds. At the same time, the brightest students, regardless of their social origin, all have a high likelihood of continuing schooling, and the least talented, irrespective of their family background, all face difficulties in continuing their educational paths.

Secondary effects stem from the differences in decision-making processes that are typically explained and analysed using rational action theory assumptions, according to which individuals' educational choices are made based on three parameters: the costs (direct and indirect), benefits, and probability of success (Boudon, 1974; Gambetta, 1987). The direct costs include educational fees, the costs of transportation, and study materials, while indirect costs are related to the foregone earnings because of not working during the period of studies. Since the Second World War the direct costs have decreased significantly due to the abolishment of school fees at lower levels of education, greater distribution of schools and universities in the territories, development of transport, and better living and employment conditions. Although the indirect costs have also diminished as a result of the prohibition of child labour, their role remained relevant for the educational choices at upper secondary and tertiary levels, as the better the economic situation and employment prospects, the greater the opportunity costs of school attendance (Ballarino & Panichella, 2021).

The benefits imply not only the expected income after obtaining a qualification but also the identity and social prestige associated with a certain educational level or occupation. According to the mechanism of relative risk aversion, individuals seek to maintain their family's social status and avoid downward social mobility (Breen & Goldthorpe, 1997). Thus, individuals coming from advantaged families have a stronger motivation to obtain higher educational degrees compared to lower-class individuals as

they aim to acquire a social position at least as favourable as their parents' position. In addition to social position, benefits also refer to actions that enhance one's identity, that is, making educational decisions consistent with a social category that an individual feels part of (Akerlof & Kranton, 2000; 2002). Therefore, for individuals coming from families where both parents have tertiary education, university enrolment is taken for granted as it reaffirms the family identity.

The probability of success is related to the previous academic performance. As mentioned above, children from upper-class families do better at school than children from disadvantaged families. In addition to that, they are more likely to overcome the risks of educational failure thanks to parental support in terms of social, cultural, and economic resources allowing them to compensate for the false steps (Bernardi, 2012). The probability of success also depends on the selectivity and complexity of the school systems. The greater the number of tracks, the more information is needed to evaluate the riskiness of an educational choice, and the more advantaged are children of educated parents, who are better informed about the school systems. The lower the age at which the choice is made, the less information is available on the abilities of children, (Erikson & Jonsson, 1996), and the greater is the importance of motivational factors related to the avoidance of downward mobility. Another aspect influencing this is the stability of family income, and more generally, welfare policies (Ballarino & Panichella, 2014), which is crucial for bearing the costs of long-term educational investment. Therefore, all the factors related to the probability of success, indicate that, for a given level of education, this parameter is higher for the children from advantaged families.

The empirical evidence on the relative importance of secondary effects shows that in the UK, secondary effects account for between a quarter and a half of class differentials in educational transitions made at the age of 16 (Jackson et al., 2007). In Sweden and the Netherlands, the importance of primary effects is estimated at around 60% (Kloosterman et al., 2009; Erikson & Rudolphi, 2010), while in Germany it is about 50% (Stocké, 2007). Italy is the country with a particularly large share of secondary effects in generating social inequalities in the choice of upper secondary track, namely 60-70% when comparing children of high- and low-educated parents and 50-70% when comparing those from intermediate and low parental education groups (Contini & Scagni, 2013).

In addition to primary and secondary effects of social origin on educational inequalities, recent research has suggested distinguishing also tertiary effects, implying the variation in teachers' behaviours and attitudes "in the institutional sorting process through their expectations, evaluations, and recommendations towards pupils with different social backgrounds" (Esser, 2016; p. 30). A broader definition of tertiary effects refers "to all the actions taken within schools reproducing inequalities, once that the macro-institutional settings of the school system have been taken into consideration" (Argentin & Pavolini, 2020). The focus on these mechanisms operating at a school level is important because they may have an impact on both primary and secondary effects, resulting in biased estimates (Schneider, 2014).

The schools can contribute to the reproduction of inequalities through the process of unfair allocation of teachers of different educational capacities and quality to students from different family backgrounds. For instance, an Italian study based on INVALSI data found a positive association between teacher effectiveness and students' educational background at a class level. (Abbiati et al. 2017). In Italy, this unfair allocation is the result of interaction between several actors: parents, schools, teachers, and principals. Highly educated parents are more likely to aspire to enrol their children in schools with a high quality of education and are more likely to make informed decisions when choosing a school (Argentin, 2009; Bordignon et al., 2017). Schools introduce pre-selection standardized assessments, specific subjects, signalling the education quality, possibility for students to choose classmates, thus creating social grouping. Teachers, looking for a more appreciative environment, often prefer to work in schools where students come from higher-educated families (Barbieri et al., 2007). Finally, school principals adopt informal strategies, involving negotiations with teachers and parents, in order to influence the allocation of teachers (Serpieri, 2012).

The role of teachers in the reproduction of social inequalities is expressed through their interactions with students and parents. Teachers' recommendations and marks transmit crucial information to parents regarding the ability of their children, which is then taken into account for making future educational choices. This information is particularly relevant for lower-educated parents having limited awareness of educational systems. Furthermore, teachers' marks and recommendations can be biased. For instance, an Italian study, using the data from INVALSI standardized tests on maths and reading,

showed that students from advantaged socio-economic backgrounds received higher marks compared to other students, both in primary and lower secondary schools (Argentin & Triventi, 2015; 2016). In addition, female students got better marks than males, and this advantage increased with age, from primary to upper secondary school. Other Italian studies investigated the teacher's recommendations at the end of lower secondary school when the crucial decisions on the choice of the upper secondary track are made. The results showed that, despite a large set of control variables, teachers are more likely to recommend lyceum enrolment to children of higher-educated parents, and this difference is greater in the middle of distribution concerning final marks, where the decisions are particularly ambiguous (Argentin et al., 2017). Moreover, these recommendations were found to influence actual choices made by students during this educational transition.

Therefore, teachers' recommendations and marks, as well as the mechanisms operating at a school level, might partly explain primary effects and influence secondary effects, biasing the educational decisions of students and parents.

The persisting role of social origin despite the educational expansion in most Western societies made the researchers analyse educational transitions in more detail, focusing on the institutional characteristics of the school system that may contribute to the intergenerational transmission of inequality. In particular, the role of different curricula or tracks in secondary education has emerged as a research subject in several countries, such as the United States (Gamoran & Mare, 1989; Hallinan, 1996; Lucas, 2001), Sweden (Breen & Jonsson, 2000), France (Ichou & Vallet, 2011), the Netherlands (Tieben et al., 2010) and Germany (Dustmann, 2004; Schneider & Tieben, 2011).

In addition, the shift in the focus from the vertical dimension of education (i.e., years of education or titles obtained) to the horizontal dimension (the choice of track or field of study) was related to the so-called "inflation of educational credentials" (Collins, 1979) implying the diminishing value of tertiary education for employers due to the increasing number of individuals with the highest educational titles. As a result, field of study has become more important in explaining the variation in individuals' labour market outcomes, in terms of both employment opportunities and earnings. Indeed, there is consistent evidence that business-related and science/math majors bring higher than average wage returns, while humanities are associated with lower than average returns (Gerber & Cheung, 2008).

In countries with early tracking, the importance of addressing the horizontal dimension is crucial already at the upper secondary school level. For instance, in Italy, enrolment in an academic track assures both a higher probability of enrolling in a university and a higher occupational return on the labour market (e.g., Pisati, 2000). Furthermore, it was shown that children from advantaged backgrounds are more likely to enrol in academic tracks, while children from lower social origins are more likely to follow vocational tracks (Breen & Jonsson, 2000; Gamoran & Mare, 1989; Lucas, 2001), and this difference persists even if they have the same levels of school performance and receive the same track recommendation from their teachers (Jackson, 2013; Barone et al., 2018). The tendency of individuals from better-off families to choose more lucrative fields of study can be explained by the Effectively Maintained Inequality (EMI) hypothesis (Lucas, 2001). According to this framework, better-off families aiming to maintain their relative advantage do not limit themselves to the vertical dimension if it does not guarantee protection from the risk of downward mobility. In other words, when there are significant vertical inequalities, advantaged families use their higher economic and cultural capital to provide their children with the highest level of education. However, as education systems expand, and access to any given level of education becomes near-universal, parents in better-off families will ensure that their offspring will get the best positions within the same educational level, namely will enrol in the most prestigious tracks or fields of study.

Thus, the analysis of educational inequalities should focus not only on the vertical dimension (i.e., the level of education attained) but also on the horizontal dimension (i.e., the choice of study fields and curricula). Moreover, in countries with early school tracking, particular attention should be paid to the role of family background in the choice of track which in turn strongly affects subsequent educational transitions and labour market outcomes of the students.

1.2 The effect of social origin over and above education.

As it has been mentioned in the OED framework, family of origin influences one's labour market outcomes not only through educational qualifications but also directly, over and above one's education. This means that among individuals with the same levels of education those who come from advantaged families, on average, achieve better labour

market outcomes. Thus, the existence of a direct effect of social origin (DESO) is considered the most evident violation of education-based meritocracy. The mechanisms underlying this effect include, on the one hand, strategic and intentional actions on the part of families (investments), on the other hand, individual characteristics and skills acquired, mainly unconsciously, through family socialization and daily interactions with parents (endowments) (Ballarino & Bernardi, 2016; Erola & Kilpi-Jakonen 2017). First, the children of entrepreneurs or self-employed, might directly inherit the family business or use parental money, gifts, and favourable borrowing for starting their own businesses, thus improving their occupational and earnings prospects. Second, individuals from better-off families might benefit from social networks, both parental ones and their own, built during their studies or acquaintances, that serve not only as a source of information on the available job opportunities and the best strategies for accessing them but also as a guarantee for employers, facilitating one's career progress within a company. Third, DESO might operate through a higher productivity of children coming from advantaged families which might depend on cognitive abilities, such as communication skills, or personality characteristics, such as assertiveness and ability to work in a team, that are acquired through family socialization and are highly valued by employers. Fourth, social origin might directly influence one's occupational success through aspirations. In other words, children from better-off families might be more career-oriented and have stronger motivation (related to the will to avoid downward social mobility) to obtain higher status and better-paying jobs, as well as more inclined to make risky but profitable professional choices. In contrast, individuals from disadvantaged families might prefer secure and stable jobs rather than more rewarding and prestigious but less secure opportunities. Finally, employers might prefer to hire individuals from advantaged families, all else being equal. Such favouritism is based on two mechanisms: statistical discrimination (Phelps, 1972) and the taste for discrimination (Becker, 1971). According to the former, since employers do not have perfect information on the productivity of candidates, they tend to categorise them into social classes based on visible characteristics, such as the way they communicate or dress. The candidates whose behaviour and appearance reveal upper-class backgrounds are considered more productive and are, thus, preferred to those who appear to come from less advantaged families. The latter mechanism, the taste for discrimination, is based on homophily, which means that employers tend to favour

candidates coming from advantaged families, like their own, simply because they prefer to deal with people similar to them, regardless of their productivity, even at the price of efficiency.

Theoretical expectations suggest that DESO should vary across educational levels, being relatively larger among the least educated and diminishing among college graduates. On the one hand, it is claimed that the labour market for better educated operates in a more meritocratic way (Breen & Jonsson, 2007) since university graduates are likely to be employed in highly bureaucratized characterised by limited subjectivity in hiring decisions and lower relevance of social networks but greater importance of educational qualifications. On the other hand, it is emphasized that individuals coming from unprivileged families who manage to attain higher educational qualifications are positively selected in terms of ability and motivation (Mare, 1993; Karlson, 2019) as they have to overcome initial disadvantages related to the limited economic and cultural resources. These traits, which are positively associated with labour market success (Zhou, 2019), are expected to counterbalance other mechanisms granting an advantage to individuals from better-off families. Indeed, some studies show that (Hout, 1988; Torche, 2011), that DESO on social class and socioeconomic status declines and almost disappears among university graduates. However, other studies find that the origin-destination association in terms of income does not vanish and even becomes larger among individuals with university or postgraduate education (e.g., Torche, 2011, 2018; Bernardi & Gil-Hernández, 2020).

The discrepancies in DESO with respect to the labour market outcomes can be explained by different parental strategies. On the one hand, according to the rational action theory of social mobility, intergenerational mobility strategies are motivated by the concern of avoiding social downgrading (Breen & Goldthorpe, 1997; Goldthorpe, 2007). Therefore, in case of an educational failure, advantaged families will mobilize their economic, cultural, and social resources to support their children in the labour market and make them avoid unskilled occupations. This strategy corresponds to the compensatory advantage model, according to which “life course trajectories of individuals from privileged backgrounds are less dependent on prior negative outcomes” (Bernardi 2014: 75). On the other hand, advantaged families may maximize the income returns of the children who succeeded in education. This mechanism, labelled as “boosting”, can be

linked to the core assumption of the effectively maintained inequality theory (EMI), stating that upper-class parents will “secure for their children some degree of advantage wherever advantages are commonly possible (Lucas, 2001: p. 1652)”. Despite being primarily applied in the research on educational inequalities, EMI can also be implemented for studying labour market outcomes, if socioeconomic status corresponding to a job is considered as a quantitative dimension of occupational attainment, whereas such aspects as, for instance, career prospects or company prestige are viewed as a qualitative dimension (Bernardi & Gil-Hernández, 2020). Thus, when there is no room for a quantitative advantage in terms of socioeconomic status, upper-class families can ensure their offspring an additional advantage with respect to the qualitative dimension by helping them to get a job that guarantees higher income prospects.

To sum up, the compensatory and boosting mechanisms can be considered as the two different ways in which better-off families mobilize their resources to the advantage of their children on different socio-economic outcomes. When children in advantaged families have low educational attainment, their parents seek to compensate for the failure and help them obtain a decent occupation. When the children are successful at school, their parents provide them with an extra boost, leading to a higher income. As a result, initial social inequality grows over time following a cumulative advantage pattern and making it difficult for an individual or group that is behind at a point in time in terms of educational attainment, income, or other measures to catch up (Merton, 1968; DiPrete & Eirich, 2006).

In addition to social origin, educational and labour market inequalities have a gendered dimension, which is discussed in the following section of this chapter.

2. Gender inequalities in contemporary societies

2.1 Explaining gender inequality in education: educational choices, preferences, and socialization.

For the most part of human history, women have received less education compared to men. In the past, education for women was mostly limited or even neglected. A widespread expansion of mass schooling over the past two centuries that has been

triggered by early industrialized countries in Western Europe and the US (Morrisson & Murtin, 2009) favoured mostly males. Only since the 19th century, there has been an advancement in female formal education that at the beginning of the 20th century, with further modernization and economic development, started to converge to male educational attainment.

One of the most important educational trends in recent years in the US and European countries has been the growing gender gap in college enrolment and completion in favour of women (Buchmann et al., 2008). In the US this female advantage developed unevenly with respect to the family background (Buchmann & DiPrete, 2006). In cohorts born before the mid-1960s, males were more likely than females to obtain a college degree and this gender difference was the largest among less-educated families. Daughters were able to reach parity with sons only in the minority of families with both college-educated parents. For cohorts born after the mid-1960s, the female advantage in college completion emerged first in households with less-educated parents or those with an absent father. Although the advantage remains largest among these families, it has gradually extended to all family types. The factors that contributed to women's increased college attainment include weakening institutional constraints, increasing age at first marriage, and increasing opportunities for women in the labour force due to legislative and cultural changes (Goldin et al., 2006).

According to the most recent UNESCO data, for the period from 1995 to 2018, at a global level, female enrolment in tertiary education has increased three times, accounting for 54% of the total increase in enrolment. Moreover, the adjusted gender parity index has grown from 0.95 to 1.14, and this female advantage has been registered in 74% of the countries with available data (UNESCO, 2020). However, it should be noted that considerable disparity at girls' expense still exists mostly in low-income countries. In 2018, for every 100 boys fewer than 90 girls were enrolled in primary education in 7 countries, in lower secondary in 14 countries, and in upper secondary education in 23 countries.

In accordance with the latest OECD data, 52% of 25-34-year-old women have a tertiary degree, compared to 39% of men in this age group. Between 2010 and 2020, the average gender gap in favour of younger women increased from 10 to 13 percentage points (OECD, 2021). For instance, in Sweden, the female advantage has widened from

13 to 18 percentage points, in Italy from 9 to 12 percentage points, in Denmark – from 15 to 17 percentage points. However, in France, Finland, Latvia, the United States, and Costa Rica the gender gap has narrowed over the last decade.

Despite the reversal of the gender gap in educational attainment, a large body of literature on gender inequalities in education points out that fields of study within higher education remain sex-segregated (Barone, 2011; Bradley, 2000). Female underrepresentation tends to be high in engineering, mathematics, and computer science, and to a lesser degree in the natural sciences. In contrast, women tend to be overrepresented in education, humanities, social sciences, law, and health fields (Vincent-Lancrin, 2008).

These gender differences have important implications for the future labour market inequalities, since humanities and the social sciences lead to less favourable prospects in terms of unemployment rates, earnings, and the risks of overeducation and skill mismatch, while engineering and computing, medicine, and the other health-related fields perform above the average (Assirelli, 2015; Barone & Ortiz, 2011; Davies & Guppy, 1997; Reimer et al., 2011). The data from the 2018 round of PISA on the 37 OECD countries show that just 7% of girls, as opposed to 15% of boys, are expected to enter science and engineering professions. In addition, less than 1% of girls in OECD countries, but around 8% of boys, aspired to work in ICT-related occupations (OECD, 2019). It is important to note that these expectations were unrelated to performance. According to PISA results, in OECD countries, only 14% of girls who were top performers in science or mathematics planned to work in science and engineering, compared with 26% of top-performing boys (Encinas-Martin, 2020). The gender gap among top performers is present even in countries characterized by high gender equality scores, such as Norway (12% of girls, 33% of boys) and Sweden (20% of girls, 37% of boys) (OECD, 2019). As indicated by a recent UNESCO report, the share of women in the Silicon Valley applicant pool for technical jobs in artificial intelligence and data science is less than 1%. Females are mainly absent from the frontiers of technological innovation, typically offering the highest wages. Globally, the proportion of women among mobile application and software developers accounts for only 6% (UNESCO, 2020).

Furthermore, the studies that apply decomposition analyses of the gender wage gap often show that the contribution of differences in major between men and women is

sizeable. Analyses of survey data from the 1970s and 1980s report that 20%-45% of the gender wage gap among college graduates is explained by gender differences in the choice of majors (Daymont & Andrisani, 1984; Gerhart, 1990; Brown & Corcoran, 1997). Other studies, using earnings data from the 1990s, show somewhat lower, but still substantial, estimates: from 15% to 25% (Joy, 2003; Shauman, 2006; Bobbit-Zeher, 2007).

Several mechanisms have been suggested to explain the persisting gender segregation in the field choice: gender differences in career expectations, skills, preferences, or values, and the persistence of gender essentialist ideology. The first set of explanations related to career expectations usually focuses on work-family orientations. According to this approach, women would prefer less lucrative fields because they are more family-oriented and thus give less weight to career opportunities or other extrinsic rewards and higher importance to family reconciliation (Ridgeway et al., 1998). However, the differences between men and women in terms of career orientations have been reduced in recent cohorts, and the remaining differences are not enough to explain the gender gap in the field of study choice and pay (Konrad et al., 2000; Bobbitt-Zeher, 2007). Moreover, it is hardly possible to accommodate these arguments with the fact of recent substantial female integration in the legal and business professions, which can be demanding in terms of working time arrangements, as well as with the overrepresentation of women in social work, nursing, and medical professions, which are often characterized by highly flexible work schedules.

With respect to gender differences in skills, the studies point to achievement gaps in math and science at earlier stages of the educational career as a common explanation for women's underrepresentation in more rewarding fields (Ceci & Williams, 2010). The data from various national and international large-scale assessments consistently show that boys have higher test scores in mathematics, while girls do better in reading (e.g., Nowell & Hedges, 1998; Gallagher & Kaufman, 2005; Marks, 2007). There are also cross-country differences: several studies find a link between math test score gaps and aggregate cultural attitudes, showing that girls in more gender-equal countries perform relatively better compared to boys (Guiso et al., 2008; Hyde & Mertz, 2009). On the one hand, the explanation related to differences in skills, goes in line with the rational choice theory, according to which individuals favour educational paths that maximize their

chances of success. However, empirical evidence provides poor support for this hypothesis (Riegle-Crumb et al. 2012; Morgan et al. 2013; Hedges et al. 1995). Indeed, there has been a considerable reduction in the gender gap in math among recent cohorts, but horizontal gender segregation in higher education has changed little (Xie & Shauman, 2005). Less empirical evidence is available concerning the alternative argument linked to differences in skills, namely, the competitive advantage hypothesis (Jonsson, 1999). If individuals choose the field of study in which they have a comparative advantage in terms of academic performance, then female students on average are more likely to enrol in fields that reward verbal abilities, such as social sciences and humanities. This hypothesis has been developed in the context of rational choice theory, but it should be pointed out that it relies on the doubtful assumption - which can hardly be reconciled with a utility-maximization approach - that girls favour less remunerative fields, even when they have the mathematical skills to succeed in more rewarding, math-intensive fields (Barone, 2011).

A more convincing explanation relates to gender differences in perceived skills. In particular, Correll (2001, 2004) points out that cultural beliefs about gender can lead to bias in student perceptions of personal competence. She found that girls underestimate their mathematical skills relative to boys (net of objective measures of ability) and that these gender-biased self-evaluations to some extent mediate gender differences in the choice of field of study. In addition, Correll provides experimental evidence of a gender-differentiated double standard for attributing performance to ability, which biases in different ways the manner male and female undergraduate students assess their competence at career-relevant tasks, net of actual ability.

A recent study by Barone et al. (2017) proposed and tested a novel explanation of gender segregation in higher education that emphasizes the misperceptions of economic returns to fields of study and the role of gender-stereotypical curricular preferences. The authors provide the results of a field experiment conducted in Italy in which high school seniors were confronted with detailed information concerning the occupational profitability of fields of study (e.g., earning differentials, related risks of unemployment, overeducation, and horizontal skill mismatch), as well as the information about vocational alternatives to college. Contrary to the claim that girls are less career-oriented than boys, the authors found that the former were much more responsive to this information.

Moreover, they reported that the intervention substantially improved the occupational prospects of the female students by decreasing their overrepresentation in less rewarding fields and by enhancing their enrolment in vocational higher education as an alternative to leaving the educational system after high school graduation. The authors argue that in the absence of proper information, the students hesitant in their choice of study field rely on oversimplified gender-stereotyped decision-making mechanisms, whereas when detailed and reliable information concerning the field of study differentials in the labor market is provided the students, especially females, make use of it.

Other explanations refer to the curricular and occupational preferences of high school seniors, which in the case of sufficiently detailed measurement turn out to be strong predictors of college major, as well as mediators of gender differences in college choice (Morgan et al. 2013). For example, girls more often exhibit a preference for humanistic subjects (e.g., literature, psychology) and related jobs (e.g., teacher, psychologist) which leads to enrolment in the humanities and the social sciences (Cech, 2013; Morgan et al., 2013). The choice of the upper secondary track or curriculum is particularly relevant for horizontal gender segregation at the tertiary level in countries where early tracking is prevalent (Imdorf et al., 2015; Smyth and Steinmetz, 2008). For example, in Italy, it was shown that curricular track choice mediates 64% of the gender differences in access to the humanities and social sciences and 29% of the gender differences in access to engineering and ICT (Barone & Assirelli, 2020). This is related to the fact that in upper secondary school girls are underrepresented in the scientific curriculum within the academic track and overrepresented in the foreign languages and socio-pedagogic curricula, while within technical and vocational tracks, females are underrepresented in industry-oriented curricula and overrepresented in service-oriented curricula.

More commonly, the studies indicate gender differences in job values and aspirations that, at a young age, determine decisions on what types of skills to seek in the course of education. Young men tend to accentuate economic success, status, and prestige in their definition of an ideal job, whereas women place greater importance on the social and altruistic opportunities offered by the job (Fiorentine, 1987; Marini et al., 1996; Jonsson, 1999; Van de Werfhorst & Kraaykamp, 2001).

Such an argument logically leads to the question: what explains gender differences in job values? Sociologists often point to society-wide gender norms as the source of such

differences. Gender-essentialist ideology combined with self-expressive value systems constitutes a strong cultural force that contributes to the persistence of horizontal gender segregation in educational systems in advanced industrial societies (Charles & Bradley, 2009). It has proven to be highly influential in forming aspirations, expectations, and life experiences, even in the most liberal egalitarian societies (Fenstermaker & West, 2002; Charles & Grusky, 2004; Correll, 2004). Modern societies are strongly permeated with beliefs about gender difference, which are embedded in practically all organizational structures and interactional contexts, including labour markets, educational systems, and families, being intensified by a vigorous Western cultural emphasis on individual self-expression and self-realization (Inglehart, 1997; Beck & Beck-Gernsheim, 2001). Normative dictates for self-expression and the associated celebration of individual choice promote gender segregation since men and women are guided by different cultural schemas and different social resources while trying to realize and express their personalities, and, in addition, anticipate that society will hold them accountable to established gender scripts (Fenstermaker & West, 2002; Correll, 2004; Ridgeway & Correll, 2004).

Gender differences are promoted through various institutionalized practices (Correll, 2001; Ridgeway & Correll, 2004). In the process of educational and career exploration, parents, teachers, and school counsellors implicitly motivate girls and boys to take different pathways into the labour market (Jacobs, 1995). For example, the research has shown that gender differences in course choices at high school reflect social control mechanisms operating through the gender-biased recognition of the “talents” and preferences by adults, as well as through peer pressure (Gabay-Egozi et al., 2015; Frank et al., 2008).

To conclude, the existing empirical evidence shows that despite the reversal of the gender gap in college attainment, the female disadvantage with respect to the horizontal dimension of educational inequalities is still present. While several explanations for this phenomenon have been put forward, there is not yet a common consensus on the causal mechanism behind it. However, it is clear that skill-based explanations and gender differences in career preferences fail to account for the gender segregation in study fields, while misperceptions of economic returns to college majors, expressive motivations related to preferences for school subjects and specific occupations, as well as curricular

track choice at upper secondary level seem to be highly relevant. Thus, future research should pay more attention to the earlier preferences and the role of curricular tracking, as well as to the mechanisms that lie behind it.

2.2 Gender inequality in the labour market

Despite women have surpassed men in terms of participation and success in higher education, they are still systematically disadvantaged in the labour market in terms of earnings and occupational attainment. The vast economic and sociological literature has been dedicated to the discussion of trends and causes of the gender wage gap. Some studies point out that since the 1970s there has been a reduction of female disadvantage in terms of income in most developed countries (Blau et al. 2006; Goldin 2014; Kunze, 2018) reflecting gender-specific developments, such as increasing educational attainment and greater labour market participation of women, as well as the success of anti-discrimination laws. However, this reduction is also related to broader economic processes, namely deindustrialization, the decline of unions, and decreasing relative wages for all workers (Bernhardt et al., 1995; Blau & Kahn, 2006; Charles, 2011; Marini & Fan, 1997). At the same time, the research also indicates that since the 2000s the progress toward gender equality has stalled (Blau & Kahn 2006; Cohen et al., 2009; England, 2010; Kunze, 2018; Sin et al., 2022). According to Eurostat (2023), in 2021, women's gross hourly earnings were on average 12.7% below those of men in the EU. Moreover, as stressed by several authors, the gender wage gap opens already after graduation (e.g., Combet & Oesch, 2019; Triventi, 2013).

Analytically the gender pay gap is studied as composed of two main components: the first component is based on gender differences in observable characteristics (“explained component”), while the second is attributed to differences in the returns to observable characteristics and other unobserved explanatory factors or possibly to employer's discrimination against women (“unexplained component”). With respect to the first component, traditionally the research has explained gender income inequality by differences in human capital between men and women (Becker, 1985). However, as it has already been noticed, the gender gap in tertiary educational attainment over the last decades has reversed in many countries in favour of women (DiPrete & Buchmann, 2013). In addition, female work experience has improved in both quantitative and

qualitative dimensions (O'Neill & Polachek 1993; O'Neill 2003). Indeed, Blau and Kahn (2017) show that by 2010 the contribution of human capital variables (education and labour market experience) to the gender wage gap has declined remarkably. Therefore, the focus has shifted to the household division of labour and parenthood.

A more important and persistent factor contributing to gender differences in observable characteristics is family. Under the traditional division of responsibilities in the family, women, anticipating their specialization in childcare and housework, may opt for jobs that are less rewarding but more reconcilable with family duties, as they require less effort and less intensive training (Blau & Kahn, 2017). Whereas men concentrate on labour market experience and acquiring job-specific skills (Becker, 1985). Upon transition to motherhood, women undergo interruptions in their working careers, reduce their working hours, or even leave the labour market, which leads to depreciation of their human capital. Reduction in time spent at work might be crucial for some high-wage occupations demanding ongoing commitment and long working hours, such as professions in business and law (Noonan et al., 2005; Bertrand et al., 2010). Moreover, Goldin (2014) argues that granting flexibility in working hours is particularly costly in some jobs where it may cause interruptions in servicing clients or difficulties in passing duties to other employees, and therefore lead to penalties for women. In addition, research shows that mothers are less likely to get promoted and experience lower earnings growth over time (Gangl & Ziefle, 2009: p. 355). Finally, according to Becker (1985), family responsibilities may cause women to devote less effort to paid work and reduce their productivity. However, empirical evidence on the productivity of female and male employees is ambiguous. Some studies show that time invested in household duties is associated with lower income (Hersch, 1991; Noonan, 2001). Other authors argue that there is no association between the gender composition of an organization and its overall productivity level (Tomaskovic-Devey & Skaggs, 1999), or point to the absence of gender differences in work effort and other pro-work behaviours (Kmec & Gorman, 2010; Kmec, 2011). Moreover, differences between female and male workers in productivity may be the result of the discriminative allocation of opportunities and workplace resources (Madden, 2012).

Another factor of gender differences in observable characteristics is occupational gender segregation, both horizontal and vertical. As shown by Blau and Kahn (2017),

while the portion of the gender pay gap explained by human capital has decreased substantially, the contribution of such factors, as occupation and industry has grown from 27 percent in 1980 to 49 percent in 2010. Horizontal segregation entails female overrepresentation in a narrower variety of sectors and jobs, frequently offering lower wages and less protection, compared to male employees. In particular, in high-income countries about one-third of working women are found in the health and education sectors, in middle-income countries women are likely to be employed in retail, trade, wholesale, and manufacturing, while in low-income countries they are concentrated in the agricultural sector (Kring, 2017). Vertical segregation implies that women are more likely to be employed in lower-ranking positions and have less access to managerial positions (Kring, 2017). The underrepresentation of women at the top of the organizational hierarchies may be related to the fact that they are “relative newcomers” and it requires time for them to move up the career ladder (the “pipeline argument”), to the barriers preventing them from receiving promotions (“glass ceiling”), to employer’s discrimination or to family reasons making women reduce their interest in higher ranking jobs or time and effort devoted to work (Blau & Kahn, 2017). Vertical segregation has important implications for inequalities between men and women in the labour market, as the research indicates that gender pay gaps at higher levels of the wage distribution are larger and have decreased at a slower pace over time compared to the gender pay gaps at lower levels of the distribution (Blau & Kahn, 2017).

Recent research has suggested a new group of explanations for the gender wage gap based on differences in psychological attributes and preferences. It has been argued that since jobs in different sectors offer different levels of job security, earnings stability, and working conditions, systematic gender differences in preferences towards risk and competition can influence wage gaps through job sorting behaviour. For instance, lab evidence consistently shows that men are more risk-prone than women (Eckel & Grossman, 2008; Croson & Gneezy, 2009), which might have further implications for wage discrepancies as job-related risks (such as job-loss risk or earning volatility) are usually remunerated by higher mean earnings. Moreover, high-profile careers often develop in highly competitive environments, where rewards are based on relative, rather than absolute, performance. Lab experiments show that women prefer to be rewarded piece-rate, while men favour tournament setting (Niederle & Vesterlund, 2007) where

their performance increases and exceeds that of women (Gneezy et al., 2003). In addition, lab findings indicate notable differences between men and women in their reactions to wins and losses in past tournaments. Women's performance tends to be adversely affected by prior losses, whereas men experience negative effects on their performance only when the stakes are notably high (Gill & Prowse, 2014).

An additional explanation for gender disparity in earnings even in identical roles, is the difference in salary negotiation approaches. Psychological literature suggests that women may earn less than their male counterparts due to a tendency to avoid competitive negotiation. As highlighted by Babcock and Laschever (2003), women may simply refrain from asking for a pay increase. The empirical evidence reveals that part of the gender wage gap is explained by women being less willing to bargain or less successful at negotiating wage premiums compared to men at equivalent firms (Sin et al, 2022; Card et al., 2016).

However, it is important to note that these differences in psychological attributes and noncognitive skills may be influenced by the social setting and therefore not be independent factors of the gender wage gap. Moreover, some gender differences in noncognitive skills may, in contrast, favour women leading to higher productivity. For example, some studies report that women rank higher than men in terms of interpersonal skills (Borghans et al., 2014). In addition, certain attributes, such as lower risk aversion or competitiveness, may be beneficial in some contexts but detrimental in others. Finally, the evidence for most of these explanations comes from laboratory experiments, which brings doubts on the generalizability of their results. As highlighted by Blau and Kahn (2017), the differences between men and women in psychological attributes or noncognitive skills account for a small to moderate part of the gender pay gap, which is substantially lower than the contribution of occupation and industry.

Further explanations for the gender pay gap are linked to the differences in wage expectations. Jackson, Gardner, and Sullivan (1992) show that female college seniors anticipate lower starting and career peak salaries and consider lower pay as fair pay. Moreover, even when provided with information on current wages, women still expect lower initial pay for themselves than men do (Martin, 1989). It is argued that lower wage expectations lead to a self-fulfilling prophecy of getting lower income (Hojat et al., 2000) and make individuals accept lower starting salary, be less persistent in seeking raises, and

less likely to look for a better job in case of dissatisfaction with salary (Gasser et al., 2000). Thus, women's lower reservation wages are likely to keep women in low-paid occupations, irrespective of their true productivity in the labour market and their academic qualifications (Orazem et al., 2003). Filippin and Ichino (2005), using data on wage expectations of students and wage realizations of graduates of an Italian university, show that the gender pay gap expected by the students one year after graduation is consistent with actual differences in earnings between their older male and female counterparts who already graduated. At the same time, contrary to the anticipation of nearly constant gender inequalities in pay 10 years after graduation, actual data show a widening gap over time. The reason behind the gender differences in expected wages remains uncertain (Heckert et al., 2002). The most complete effort to explain these differences is made by Major and Konar (1984), who suggested five factors encompassing the human capital approach: type of academic and professional careers chosen by women, objective job inputs, women's perceptions of their own-job-related inputs, the importance given to various job characteristics (e.g., salary, job security) and expected pay for comparison others.

The part of the gender wage gap that remains unexplained has been commonly attributed to market failure (discrimination) or measurement error. Survey experiments provide evidence that employers assign higher wages to men than women even if their skills and qualifications are equivalent (e.g., Auspurg, et al., 2017; Jasso & Webster, 1997). From the theoretical point of view, differentiation is often made between statistical discrimination - assuming imperfect information and uncertainty and, thus different expected productivity attributed to members of different groups - and taste-based discrimination originating from stereotypes and prejudice. However, in practice, these types of discrimination may overlap, as employer's estimates about the productivity of workers are rather based on beliefs and stereotypes than on statistical information on productivity (Tomaskovic-Devey & Skaggs, 1999: p. 424). It is also important to note that the unexplained part of the gender wage gap may either overestimate the extent of discrimination, in case male employees have higher unmeasured productivity, or underestimate it, if female employees have better unmeasured characteristics (e.g., interpersonal skills) or if one or more explanatory variables (e.g., occupation, experience) have themselves been influenced by discrimination (Blau & Kahn, 2017: p. 832).

Furthermore, the unexplained portion of the gender wage gap might stem from the gender differences in market returns to productivity-enhancing characteristics. These discrepancies might be explained either by differences in the behaviours of men and women (individual-level factors) or by the structural mechanisms and processes in the labour market (macro-level factors). On the one hand, socialization and social control processes emphasize women's commitment to unpaid domestic and care work, pushing them towards positions and employment patterns that pay less and offer limited possibilities for wage increase and promotions due to reduced workload or low productivity. Such processes, thus, not only account for the differences in human capital between men and women (the explained portion) but also for the inferior returns that women get for the same human capital (the unexplained portion). On the other hand, at a macro level, entrenched gender beliefs result in the undervaluation of fields, jobs and tasks primarily undertaken by women or described as feminine. That is, women get low returns as they acquire female-typical skills and tend to work in female-dominated jobs that are paid less in the labour market. Moreover, it has been found that as more women enter fields and occupations that have been traditionally male-dominated, these fields and occupations suffer from devaluation, and the rewards they offer diminish (England, 1992; Levanon et al., 2009; Mandel, 2018).

The recent empirical evidence from PSID data has shown that men's returns to education and work experience indeed exceed those of women (Rotman & Mandel, 2023). In contrast to the well-documented trend of narrowing gender gaps in skills and earnings, the divergence in returns widens over time in men's favour. In addition, the existing gender disparities in returns to skills account for a larger proportion of the gender wage gap compared to differences in levels of education and experience. This implies that further improvements in women's human capital will hardly contribute to the reduction of their wage disadvantage, since their lower earnings mainly stem from the undervaluation of their skills.

3. The interplay between gender and social inequalities

The effects of social class of origin and gender on educational choices and labour market outcomes are often studied separately and the body of research analysing the interaction between the two status characteristics is relatively limited. The importance of addressing

this issue is related to the possibility of deepening the understanding of how different factors of advantage/disadvantage interact with each other. On the one hand, similar to the Matthew effect described by Merton (1968), being a woman with a lower socioeconomic background might result in accumulation of disadvantages in educational and labour market outcomes. On the other hand, a privileged socioeconomic background might foster more lucrative educational choices for women or compensate for their penalization in the labour market.

With respect to educational choices, two possible mechanisms might be considered to explain the influence of gender and social origin: relative risk aversion and differences in socialization processes due to parental education or social class. As mentioned in one of the previous sections, relative risk aversion theory assumes that individuals tend to make educational choices that allow them to maintain their parents' social class position and social status, thus avoiding downward mobility. For men from advantaged backgrounds choosing female-dominated fields of study may incur a risk of status loss, since these fields lead to occupations that pay less on average (Bobbitt-Zeher, 2007; Hallsten, 2010). On the contrary, male-dominated fields (e.g., engineering, mathematics, computer science) or elite gender-balanced fields (e.g., medicine, law, or business) bring more chances for class and status maintenance. For men from lower social classes, any curriculum of the academic track of upper secondary school or any field of study at the university represents a path to upward mobility. Moreover, female-dominated fields may be seen by them as less risky and safer options, especially if these fields lead to respectable middle-class occupations (Lupton, 2006), such as school teachers or pharmacists. For women, male-dominated fields, gender-balanced elite fields at the university level, as well as the scientific curriculum of academic track at upper secondary school may provide additional to university education benefits in terms of status and labour market prospects. Avoidance of female-dominated paths may be particularly relevant for women from upper social classes aiming to maintain their advantaged positions. To sum up, relative risk aversion theory leads to a prediction that women from upper social classes would be more likely to choose gender-atypical fields of study compared to lower-class women. On the other hand, men from advantaged backgrounds would be more likely to choose gender-typical fields of study compared to less advantaged males.

Concerning the choice of curriculum within technical and vocational tracks of upper secondary education, the impact of the social class of origin might be expected to predominate the effect of gender for men and women from advantaged families (Prix & Kilpi-Jakonen, 2022). Given that the choice of technical or vocational track is highly unlikely for these individuals and is associated with downward mobility, the decision about the curriculum within these tracks would be influenced more by an inclination to buffer already unsuccessful choices rather than by gender connotations. Therefore, both men and women from the upper classes would be less likely to choose male-dominated curricula leading to blue-collar manual occupations and more likely to follow female-dominated paths linked to care and service occupations. For men and women from lower classes, vocational and technical tracks represent a way of maintaining their social origin positions, thus the choice between male- or female-dominated curricula might be less relevant.

The second mechanism relates to the fact that the impact of gender stereotypes could vary between different social classes due to class differences in the commitment to gender egalitarianism. The tendency to make educational choices in accordance with gender stereotypes could be moderated either by socialization or by parents' encouraging gender-atypical choices. Previous research has shown that gender-egalitarian attitudes and forms of behaviour are more widespread in the upper and middle classes and among higher-educated parents, as opposed to the working class (Davis & Greenstein, 2009; Dryler, 1998). The latter has been characterized as having more rigid traditional gender roles, aligned with essentialist notions of female and male dispositions and abilities. Therefore, both men and women from upper- or middle-class families would experience a more gender-egalitarian environment than their counterparts from disadvantaged social origins, and the differences in gender role socialization would result in a higher probability of gender-atypical choices. However, regardless of how gender-egalitarian parents may be, it seems unlikely that upper-class families would encourage choices that would effectively lead to downward mobility for their children.

Empirical evidence shows that women from higher social backgrounds, defined by parental educational level, socioeconomic status, or class, are more likely to choose male-dominated fields than women from lower social backgrounds (e.g., Berggren, 2008; Dryler, 1998; Trusty, et al., 2000). The findings about men's choices are less

straightforward. Some studies have found that men from higher social backgrounds are more likely to choose male-dominated programs compared to men from lower social backgrounds (Hansen, 1993). Other studies have shown that men from higher social backgrounds are more likely to follow female-dominated paths compared to their counterparts from lower social backgrounds (Dryler, 1998; Støren & Arnesen, 2007). Van de Werfhorst (2017) found a lower level of gender segregation among men and women of higher social origins since women from upper-class families are more likely to choose the science, technology, engineering, and maths fields, while men with higher social backgrounds are more likely to choose health programs (mostly medicine). At the same time, the author points out that women and men from higher social origins only choose gender atypically if the fields they enrol in are known to guarantee good labour market prospects.

A recent study using Finnish register data showed that the impact of social origin on the probability of applying to gender-typical or gender-atypical fields depends not only on gender but also on the educational level targeted (Prix & Kilpi-Jakonen, 2022). For instance, women with highly educated parents were more likely to make gender-atypical choices only if they applied to the university, but not when submitting vocational applications. Similarly, men with highly educated parents were less likely to make gender-typical choices when applying to vocational education, but not when applying to university. Working-class men were more likely to consider female-dominated paths in their university applications compared to their male counterparts from advantaged backgrounds.

With respect to the labour market outcomes, a privileged socioeconomic background might compensate for the low-status identity of being female, which can be especially relevant for high-status managerial and professional careers, where women have been historically underrepresented. Indeed, it was shown that, despite the female disadvantage in obtaining high-status jobs compared to men, the women who first succeeded in overcoming this obstacle decades ago were more likely to be from upper-class families (Kanter, 1977; Epstein, 1981).

At the same time, a status characteristic of being a woman may come into conflict with “ideal worker” norms (Williams, 2001) predominant in many types of professional organizations, which require complete devotion to work (Blair-Loy, 2003). Provided the

norms of “intensive mothering” (Hays, 1996) are prevalent among socioeconomically advantaged families (Lareau & Weininger, 2003), employers may perceive women from upper-class families as less committed to demanding careers and less desirable than upper-class men. A field experiment study examining the effect of social class signals on hiring decisions in large U.S. law firms showed that given equal professional and academic qualifications, male candidates from socioeconomically advantaged families got significantly more callbacks compared to lower-class candidates, while upper-class women failed to benefit from their privileged backgrounds (Rivera & Tilcsik, 2016). As argued by the authors of the study, this interaction between gender and social class of origin signals may be related to a commitment penalty faced by higher-class female candidates which neutralizes any class advantage that they get in the assessment process.

It should be noted that gendered patterns of DESO might vary depending on a measure of destination (Bernardi & Ballarino, 2016). The studies focusing on the International Socio-Economic Index of Occupational Status (ISEI) find greater DESO for men (Mastekaasa, 2016; Bernardi, 2016), while those that analyse income show greater DESO for women (Ballarino et al, 2016; Zimmermann & Seiler, 2019). This discrepancy is likely to be the result of occupational sex segregation combined with the different nature of ISEI and income. Since women are likely to be underrepresented in the occupations at the top and the bottom of the ISEI distribution, the variation of their ISEI is likely to be smaller compared to men, which, in turn, results in a smaller effect of family background on individual female occupational attainment. At the same time, there is more income variation among women due to the differences in the number of working hours and the sectors in which they are employed: on the one hand, women tend to occupy very low-paid jobs in personal services and relatively low-paid jobs in the public sector, on the one hand, women are also employed in relatively high-income jobs in the private sector where family resources may play an important role for occupational attainment.

4. The role of family structure and dynamics in explaining the interplay between social and gender inequalities. The empirical strategy of the thesis.

As it was pointed out in section 1, the main analytical tool of social stratification research, the OED triangle, was developed in the late 1960s characterised by the prevalence of the male breadwinner model and reproductive behaviours. However, since then, Western

European societies have undergone substantial demographic changes accompanied by a shift in values structure. These transformations resulted in a greater heterogeneity of social and demographic characteristics of the families, making social stratification researchers extend the meaning of the first element of the triangle, the social origin (O), over and above the cultural and economic resources of the family of origin (Guetto & Panichella, 2019) and pay attention to such characteristics as gender and family structures. This thesis, thus, aims to explore, using various techniques and research inquiries, how family structures and dynamics in different contexts impact women's life opportunities and how these effects vary based on their social class background. The study considers two areas: education and the labour market, taking into account the roles of both family of origin and family of “destination”. This thesis consists of three empirical studies following an analytical framework relying on the OED model complemented with the gender dimension and the two additional elements: on the one hand, the environment and the structure (sibling gender composition, their birth order) of the family of origin, on the other hand, the dynamics within the family of destination (parenthood, migration) (Figure 2).

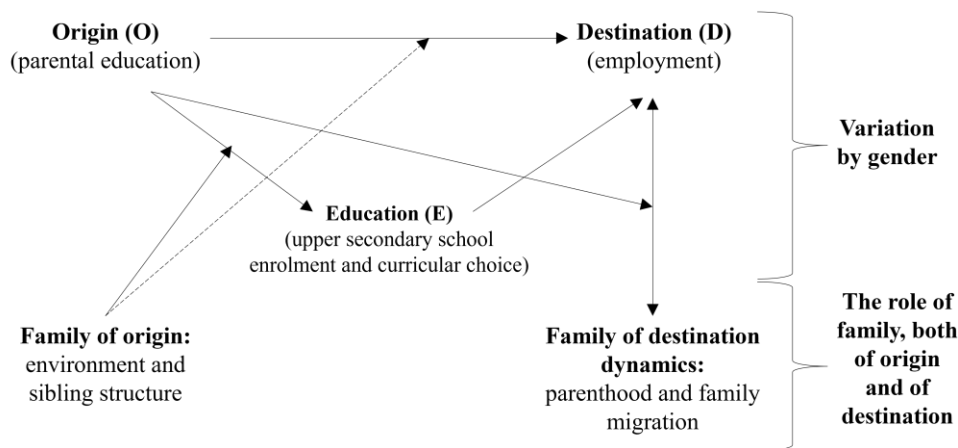


Figure 2 - Theoretical framework of the thesis.

The first study is focused on the analysis of IEO, that is OE association, influenced by the environment and the structure (sibling gender composition, their birth order) of the family of origin. In addition to parents, siblings represent an influential source of socialization. Although siblings share genes and often grow up in a similar environment,

their outcomes can vary substantially (Bjorklund & Jantti, 2012), possibly due to the differences in individual experiences of the social environment within the family depending on the siblings' compositional characteristics. The studies that have focused on the individual differences among the children in the same family have employed family fixed effects models, allowing to measure the impact of child-specific factors (gender, birth order, maternal age, etc.) on within-family differences in educational outcomes, controlling for unobserved confounding variables, which are constant between siblings at the family level and in the environment. On the other hand, the studies interested in the overall impact of the common milieu on the siblings' outcomes have applied a sibling correlation approach, providing a comprehensive measure of the importance of family background and community effects (Björklund & Jäntti, 2020), including the unobserved factors (for instance, parental motivation and parenting styles). However, neither of the studies of these two groups has considered the horizontal dimension of educational inequalities. As it has been mentioned in the previous sections, the expansion of upper secondary and tertiary education in Western Europe results in an increasing importance of tracks, curricula, and fields of study in the reproduction of inequalities across generations. Moreover, the horizontal dimension is crucial for understanding gender inequalities in education and labour market. Despite women have surpassed men in terms of participation and success in higher education, they are still less likely to enrol in the fields of science, technology, and math (Charles & Bradley, 2009), which are associated with relatively lower returns on the labour market compared to humanities where women tend to be overrepresented.

The first study of this thesis employs a sibling correlation approach, allowing to obtain a comprehensive measure of the weight of family of origin with respect to the school outcomes, capturing both vertical and horizontal dimensions of IEO. Furthermore, the study aims at analysing within-family gender differences in educational outcomes and their heterogeneity depending on the birth order and sibling gender composition using family fixed effects models. Contextually, the analysis is based on the Italian labour force survey data concerning upper secondary education in terms of enrolment and the choice of a study program. The use of Italian data is explained by the availability of detailed information on educational paths.

The following research questions are posed:

(a) What is the weight of the overall family background with respect to upper secondary school enrolment and the choice of science/industry-oriented curricula?

(b) How does this weight vary depending on the family's socioeconomic status?

(c) Are there gender differences in the probability of upper secondary school enrolment and the choice of science/industry-oriented curricula, once the family-related factors that are constant among the siblings are taken into account?

(d) How do these differences vary depending on the family's socioeconomic status?

(e) Do the educational outcomes vary depending on one's birth order and sibling gender composition?

The second study is focused on the context of the family of destination and examines a specific case where the role of women within the family creates particular conditions of disadvantage, namely that of family geographical mobility. While considerable attention has been paid by the literature to the transition to parenthood that has been shown to result in women's reduced labour force participation and income penalization (the so-called "motherhood penalty"), less is known about the impact of family migration (Cooke et al., 2009). Although single women, like single men, were found to benefit from geographical mobility (GM) by taking advantage of better job opportunities offered in locations different from their place of origin or current residence (e.g., Geist & McManus, 2012; Jacobsen & Levin, 1997; Maxwell, 1988), partnered or family migration was shown to result in unfavourable labour market outcomes for females while improving the earnings of men (Cooke, 2003; Jacobsen & Levin, 2000).

The diverging outcomes of family migration for men and women were linked by the literature to the human capital theory of migration (Mincer, 1978), according to which couples move when the overall family utility from doing so is maximized. This means that family migration might take place even when it does not bring positive returns to every single member. Although the human capital theory of migration assumes a gender-neutral approach to family decision-making about migration, studies suggest that migration decisions are often influenced primarily by the husband's human capital, making women more likely to become "tied migrants" or "trailing spouses" (Lersch, 2016; Bielby & Bielby, 1992). Consequently, since families are more inclined to move in response to the husband's employment opportunities, women often migrate only after their husbands have attained a certain level of job security and economic stability in order

to reunite with the family. This pattern of tied migration, where the husband's employment goals take priority, can have negative implications for the occupational integration of immigrant women, thus limiting the occupational returns of geographical mobility among women.

The tied migration hypothesis remains a theoretical proposition, and its empirical testing has been limited by the scarcity of data that capture information on residential, family, and employment histories both in the country of origin and in the host society. The planning of family migration strategies typically occurs before migration, and this critical period of decision-making involves complex interrelationships between migration decisions and other biographical events (Mulder & Wagner, 1993; Impicciatore & Panichella, 2019). However, cross-sectional data collected in the host societies often do not capture these pre-migration dynamics, which makes it difficult to test the tied migration hypothesis. As a result, more panel data that track the occupational trajectories of migrants in destination countries and the interplay between family and migration dynamics in the society of origin are needed to advance our understanding of this important phenomenon (see Ballarino & Panichella, 2018).

The empirical objective of the second study is to investigate how the influence of geographical mobility on women's employment differs based on their family and migration backgrounds and to identify potential patterns of advantage or disadvantage that accumulate throughout their lives. Specifically, the study focuses on interregional migration within Europe, defined as a move between two regions (NUTS 2 level) within the same country. Three research questions are posed:

(a) Are women who engage in tied migration, relocating after their partners, penalized than those who move alone or before their partner?

(b) Can women's education mitigate the negative effects of tied migration on their occupational success?

(c) How does the interplay between family migration dynamics and family behaviours foster the process of accumulation of (dis)advantages over the life course?

The study is based on SHARELIFE data, providing retrospective information on one's occupational, residential, and family histories, including the period of engagement. This allows for a more precise identification of the effects of family separation and tied

migration, given the complex synchronicity and interplay between migration and other biographical events (Windzio et al., 2011; Impicciatore & Panichella, 2019).

The third study is focused on the interplay between the family-of-origin (social class of origin) and family-of-destination factors (motherhood, partner's resources) in determining women's employment outcomes. While several studies have examined how educational level affects women's employment opportunities (e.g., Steiber et al, 2016; Evertsson et al., 2009), no research (to the best knowledge of the author) has been done on the impact of family background, net of education. The direct effect of social origin on mothers' labour market outcomes might operate through access to social networks, employers' favouritism, inheritance of family business or financial resources, possibly resulting in a cumulative or double disadvantage for women from less privileged family backgrounds or compensating the penalty for women from better-off origins. Moreover, the effect of social origin might vary depending on the factors related to the family of destination, such as the partner's resources (his education and/or occupational status). Empirical evidence has shown that the husband's social standing has a negative impact on a woman's employment in couples where a male partner has a comparative advantage in terms of education or occupational status, whereas it exerts no effect in high-status homogeneous couples (Bernardi, 1999; Vandecasteele & Esche, 2015). At the same time, to the best of the author's knowledge, it has not been investigated, how partner's resources interact with a woman's social origin, net of her education, and whether this interaction creates an additional source of cumulative (dis)advantage. Furthermore, on top of the individual-level factors, the employment of mothers is determined by the macro context characterised by the country's family policies, gender norms, and labour market structure and regulations. The impact of social origin on motherhood employment penalty might be particularly pronounced in contexts with weak state support for female employment, traditional gender norms, limited secondary segment, and limited part-time opportunities, as well as in countries with strict employment protection regulation.

Using the SHARELIFE data, the third study aims to answer the following research questions:

(a) Do mothers with advantaged social origin have higher chances of being employed compared to mothers with less privileged backgrounds, net of the educational level?

(b) Does the DESO on the employment probability of mothers change according to the number of children?

(c) Does a partner's higher social standing lead to a cumulative advantage for mothers from upper and middle social classes of origin?

(d) Does the impact of the partner's social class of origin on employment probabilities of mothers from different social origins vary according to the number of children in the family?

(e) How does the DESO on employment probabilities of mothers differ across the countries? Thus, the third study makes the first attempt to uncover the role of social origin for mothers' employment chances, thereby connecting the literature on social stratification with the research on gender inequalities, adding to the studies on cumulative (dis)advantage (Diprete & Eirich, 2006) and employing a comparative perspective.

Chapter 2

Family Socioeconomic Background, Gender, and Sibling Correlation in Education. An Analysis of Educational Inequality in Upper Secondary School in Italy.

In contemporary societies, education plays a central role in the life course of individuals. Schools socialize individuals to desirable behaviours, transmit knowledge and skills, verify, and certify the preparedness to perform a specific activity, thus contributing to social stratification by allocating individuals into occupations. In addition to performing the functions of socialization, knowledge transmission, and selection, education brings important benefits to individuals and society. Empirical evidence shows that highly educated individuals live healthier lives (Mirowski & Ross 2003), participate more fully in civil society and politics (Verba et al. 1995, Nie et al. 1996, Putnam 2000), are less likely to divorce (Schwartz, 2010) and bring productivity gains to the whole communities through the processes of social pressure and learning (Moretti, 2004, 2012). All these factors make educational inequalities a highly important area of research, where one can distinguish three aspects: inequality of educational levels, inequality of educational outcomes, and inequality of educational opportunities. The first aspect is related to the vertical stratification of educational pathways and implies that some individuals obtain higher degrees than others. The second aspect implies the differences in the level of competencies and skills acquired at school. The third aspect means the differences in qualifications attained by individuals from different social groups, defined by the social class or education of their parents, or by gender, ethnicity, and any other ascribed characteristics.

With regard to the inequality of educational opportunities (IEO), the dominant thesis in social science in the 1980s and 1990s was that of persistent inequalities, which contradicted the predictions of modernization theory. The seminal study by Blossfeld and Shavit (1993) showed that notwithstanding the educational expansion during the 20th century in the 13 countries analysed in their project, IEO were stable in all these countries, except for Sweden and the Netherlands. However, later empirical evidence has shifted

towards the decline in IEO, which was found in Germany (e.g., Mayer et al., 2007; Blossfeld et al., 2015), France (Falcon & Bataille, 2018), Italy (e.g., Ballarino et al., 2009; Barone et al., 2010), Spain (Ballarino et al., 2009), the US (Bernardi et al., 2018; Hertel & Pfeffer, 2016), Sweden (Esping-Andersen, 2014; Erikson & Jonsson, 1996) and other Scandinavian countries (Kivinen & Rinne, 1996; Esping-Andersen, 2014). It should be noted that these findings are related to the cohorts born in the 1940s and 1950s and schooled in a period of dramatic economic growth, whereas for cohorts schooled in the two following decades, the increasing evidence has indicated the stability of IEO (e.g., Barone & Ruggera, 2016; Bernardi et al., 2018; Hout & Janus, 2011). In sum, empirical evidence does not support either the predictions of modernization theory, or the hypothesis of persistent IEO supported by the social reproduction theory (Barone, 2019), but what is clear, education is still strongly affected by family socioeconomic background.

One of the most important educational trends in recent years in Western countries has been the reversal of the gender gap in educational attainment. While in the past men have always received more education than women, nowadays females surpass males in terms of participation and success in higher education. However, gender imbalance with respect to the horizontal dimension of educational systems, that is fields of study or tracks, remains substantial. Women continue to be underrepresented in engineering, mathematics, and computer science, and to a lesser degree in the natural sciences. At the same time, they are likely to be overrepresented in education, humanities, social sciences, law, and health fields. This pattern of choice has crucial implications for the labour market inequalities, since humanities and social sciences lead to less favourable prospects in terms of unemployment rates and earnings compared to engineering and computer science.

The family represents an important socializing environment that affects educational choices. While it is well established that parental socioeconomic background and investment, as well as genetic inheritance, play a crucial role in determining opportunity structures, and, as a consequence, the educational and socioeconomic trajectories that are followed in life, less is known about the role of siblings and sibling group composition. Moreover, despite the fact that siblings share the same home and partially the same genes, their outcomes vary substantially (Björklund & Jäntti 2012). Part of this variation results

from divergent experiences within the family that are linked to differences in individual characteristics, such as gender and birth order. Cultural beliefs about gender roles reproduced through socialization within the family are likely to make men and women feel entitled to choose gender-typical fields. As for birth order, the evidence shows that parents tend to invest more resources in first-born children, who result having a higher grade point average in school, higher completed educational attainment, and a higher probability of applying to and graduating from, medicine and engineering programs at university, compared to later-born children (Barclay, 2015; Barclay et al., 2017; Bjerkedal et al., 2007; Black et al., 2005).

This study provides *between- and within-family analysis* of educational inequalities in upper secondary education in Italy, including the decision to enrol and the choice of the science/industry-oriented curriculum within the three tracks (academic, technical, and vocational). The aims of the study are threefold: first, to quantify the fraction of variance in educational outcomes attributed to the family background (sibling correlations) and its heterogeneity by socioeconomic background; second, to estimate the impact of gender and birth order interacted with gender on within-family differences in educational outcomes, as well as to analyse the variation of the estimates by socioeconomic background; third, to analyse the interacted impact of sibling gender composition and birth order on educational outcomes of males and females.

This work brings several contributions to the previous literature. First, no previous studies on sibling differences and similarities in educational outcomes have been conducted using Italian data. Second, most of the existing empirical evidence on siblings is related to earnings and such educational outcomes as cognitive skills, school grades, and years of education, while little attention is paid to upper secondary education and curriculum choice. The focus on upper-secondary education is crucial for the analysis of inequalities in countries with highly differentiated educational systems where early choices are important predictors of future socioeconomic outcomes.

In the case of Italy, the analysis of upper secondary school inequalities is important for two main reasons. First, even though starting in 2007 education in Italy has become compulsory up to 16 years of age, the dropout rates before reaching this age limit are still high, especially in the first years of upper secondary school (Guetto & Panichella, 2019). Second, notwithstanding the educational expansion and the resulting reduction of

inequality of educational opportunities at this school level in Italy, social inequality persists through the association between socioeconomic background and track choice (Panichella & Triventi, 2014; Guetto & Vergolini, 2017).

Another contribution of this study is between- and within-family analysis of inequalities within the educational paths based on their curriculum which is possible thanks to the large sample size of original data that has not yet been used to study educational inequalities in Italy. The analysis of differentiation within the tracks is important due to its link to future gender inequalities in the labour market. Within the academic track, girls are less likely than boys to choose the scientific curriculum and are more likely to study foreign languages and socio-pedagogic programs. In technical and vocational tracks, females are underrepresented in industry-oriented curricula and are overrepresented in service-oriented curricula (tourism, catering, accounting, etc.). This segregation accounts for almost two-thirds of gender differences in access to the humanities and social sciences, and almost one-third of the gender gap in engineering and computing at the university level (Barone & Assirelli, 2020). Further, these choices bring less advantageous labour market prospects for women with respect to income, unemployment rates, and the risks of overeducation and skill mismatch, which are the outcomes found to be associated with humanities and the social sciences (Assirelli 2015; Barone & Ortiz, 2011; Davies & Guppy, 1997; Reimer et al., 2011).

The chapter is structured as follows. The first five sections describe between- and within-family approaches to analysing educational inequalities, such as sibling correlations and family fixed effects, and provides the respective empirical evidence. The sixth section is dedicated to the Italian context, describing the upper secondary school structure and its stratification based on social origin and gender. Further, the study proceeds with a description of data, methods, analytical strategy, and results.

1. Sibling correlation approach: advantages and limitations of utilising sibling data.

The most popular approach to studying IEO is the analysis of differences in economic and educational outcomes *between* individuals coming from different families. This method, called the *intergenerational mobility approach*, is based on the estimation of the relationship between parents' income, earnings, or education and the same outcome of their offspring. An alternative way is to compute the fraction of total inequality (measured

as the variance) attributed to the factors shared by the children belonging to the same family. The key advantage of this method, *called sibling correlation*, compared to the intergenerational mobility approach, is that it provides a comprehensive measure of the importance of family background and community effects (Björklund & Jäntti, 2020), including the unobserved factors (for instance, parental motivation and parenting styles). The studies using the sibling correlation approach show that around half of the variation in educational outcomes is explained by the family background, which implies that another half of the variation arises *within the families*, due to the individual differences between siblings (Grätz, 2018). Therefore, the research on educational inequalities should not only rely on between-family analysis but also involve *within-family analysis* using *family fixed-effects models*. These models allow measuring the impact of child-specific factors (gender, birth order, maternal age, etc.) on within-family differences in educational outcomes, controlling for unobserved confounding variables, which are constant between siblings at the family level and in the environment.

The developments of the fourth generation of intergenerational mobility allowed to extend the analysis of the role of the social environment in one's socioeconomic outcomes. Compared to the most popular approach using multivariate regressions to estimate the relationship between parents' income, earnings, or education and the same outcome of their offspring, an alternative approach, sibling correlation, provided a comprehensive measure of the importance of family background and community effects (Björklund & Jäntti, 2020). Sibling correlation is computed as the fraction of total inequality (measured as the variance) that can be attributed to factors (observed and unobserved) shared by siblings, such as parental resources, parental influences (aspirations, cultural inheritance), as well as school, church, and neighbourhood effects, and interactions among siblings. Sibling correlation has also been used as an indicator of social mobility, with weak correlations implying higher intergenerational mobility (i.e., less dependence on the family background) and stronger correlations suggesting stronger family transmission of social (dis)advantage, hence lower social mobility (Grätz et al., 2021).

Compared to the intergenerational mobility approach, sibling correlation has several advantages (Grätz et al., 2021). First, as opposed to the intergenerational mobility studies focusing on a single characteristic of the family background (e.g., education, income,

social class, or occupation), sibling correlation comprises all the characteristics that are transmitted from one generation to another. Second, most studies using the intergenerational mobility approach are still based on information about the father, while sibling correlation captures the influence of both parents. Third, in addition to the immediate environment at home, sibling correlation reflects the common factors outside the family, including neighbourhood and school effects. Finally, sibling correlation takes into account unobserved characteristics shared by the children belonging to the same family, for instance, parental motivation, family values, and interactions among siblings.

However, the sibling correlation approach also has its disadvantages. The main drawback of this method is that it does not account for the differences between children within the same family that might have an influence on educational outcomes. For example, empirical evidence shows that there is a negative impact of higher birth order on a child's cognitive skills and educational outcomes (e.g., Black, et al., 2005; Booth & Kee, 2009; Kristensen & Bjerkedal, 2010). Other factors, not captured by sibling correlation include differential treatment of children by parents, genetic traits not shared by siblings, gender, and age. The second drawback of sibling correlation is that it is calculated using the data on families with more than one child, which raises concerns about the generalizability of the findings to the families with singletons.

The studies on siblings' similarity in education have mostly considered such outcomes as years of education attained, school grades, and cognitive skills (Tab. 1). The results vary depending on the countries, cohorts analysed, and gender of the siblings. Sibling correlations on cognitive skills vary from 0.42 in Germany (Grätz, 2018) to 0.56 in the USA (Duncan et al., 2001). The estimates for school grades range from 0.42 in the USA (Grätz et al., 2021) to 0.54-0.61 in England (Nicoletti and Rabe, 2013). The share of variance in years of education attributed to family background varies between 0.38 in Sweden (Hällsten & Thaning, 2018) and 0.60 in the USA (Mazumder, 2008). A recent study focusing on the probability of obtaining a university degree in Scotland found that about 40% of the variation in this outcome is related to siblings' shared family characteristics (Duta et al., 2021). Given that the effects of social background tend to diminish across educational transitions (Mare, 1980), it might be expected that sibling correlation in upper secondary school enrolment is at least not less than sibling correlation found with respect to years of education and probability of obtaining a university degree.

Table 1 - Overview of estimates of sibling correlations at the population level from previous research.

Study	Country	Data	Respondents' Gender	Estimate (SE in parentheses)
Outcome: Cognitive Skills				
Anger and Schnitzlein (2017)	Germany	SOEP	Mixed	.55 (.05) – .61 (.06)
Björklund and Jäntti (2012)	Sweden	Registers	Male	.47 (.01)
Duncan et al. (2001)	USA	Add Health	Male	.46 (.07)
Duncan et al. (2001)	USA	Add Health	Female	.56 (.05)
Grätz (2018)	Germany	SOEP	Mixed	.42 (.03)
Outcome: School Grades				
Björklund and Jäntti (2012)	Sweden	Registers	Mixed	.51 (.01)
Nicoletti and Rabe (2013)	England	Registers (National Pupil Database)	Mixed	.54 (.00) – .61 (.00)
Outcome: Final Educational Attainment (years of education)				
Björklund and Jäntti (2012)	Sweden	Registers	Mixed	.39 (.00)
Björklund and Salvanes (2011)	Norway	Registers	Mixed	.40 (.01) – .42 (0.1)
Björklund et al. (2009)	Sweden	Registers	Male	.46 (.01) – .48 (.02)
Conley and Glauber (2008)	USA	PSID	Mixed	.63 (.05)
Hällsten and Thaning (2018)	Sweden	Registers	Mixed	.38 (n/a)
Marks and Mooi-Recci (2016)	Australia	Data source not named in the paper	Mixed	.34 (n/a) – .58 (n/a)
Mazumder (2008)	USA	PSID	Mixed	.60 (.01)
Raaum et al. (2006)	Norway	Registers	Male	.42 (.01)
Raaum et al. (2006)	Norway	Registers	Female	.46 (.01) – .47 (.01)
Schnitzlein (2014)	Germany	SOEP	Male	.66 (.04)
Schnitzlein (2014)	Germany	SOEP	Female	.55 (.05)
Sieben et al. (2001)	West Germany	German Life History Study	Mixed	.38 (n/a) – .48 (n/a)
Sieben et al. (2001)	East Germany	German Life History Study	Mixed	.24 (n/a) – .30 (n/a)
Sieben et al. (2001)	Netherlands	Familie-enquete Nederlands Bevolking	Mixed	.41 (n/a) – .52 (n/a)

Source: Grätz, M., Barclay, K. J., Wiborg, Ø. N., Lyngstad, T. H., Karhula, A., Erola, J., Präg, P., Laidley, T., & Conley, D. (2021). Sibling Similarity in Education Across and Within Societies. *Demography*, 58(3), p.1020.

The only study related to upper secondary school showed that 0.51 of the variation in upper track (*Gymnasium*) attendance in Germany at age 16-17 is explained by the family background (Grätz, 2018). With respect to the choice of track or major, no previous studies applied the sibling correlation approach. Since the decision regarding the track

and the curricula is made at an early age (14 years), the influence of parents is expected to be substantial and not lower than the role of individual characteristics.

2. Sibling correlations and parental socio-economic background

The literature usually distinguishes two main theories that explain the variation of sibling correlations by family background. Both theories focus on parental investment strategies, given their children's endowments and the available resources, but lead to opposite predictions. According to parental reinforcement theories, advantaged families invest more in the human capital of better-endowed children, which results in a greater within-family inequality compared to less privileged families, unable to invest optimally in their children due to limited resources (Becker 1991; Becker & Tomes, 1979, 1986). An alternative approach argues that parents tend to compensate for ability differences between their children in order to avoid future inequalities (Behrman et al., 1982). In this case, it is expected that better-off families will be more likely to adopt compensatory strategies by investing more in the offspring having fewer chances for success in education (Conley, 2004, 2008; Griliches, 1979). On the contrary, disadvantaged families, given budget constraints, would invest more in a child for whom they expect greater returns and future wealth transfers, including transfers towards the less-endowed offspring (Conley, 2008). Therefore, this theoretical approach leads to an opposite prediction, namely a higher similarity between siblings in upper-class families than in less privileged ones. At the same time, in reality, parents might be simply unable to follow either of these two strategies as they fail to assess the future returns on their investments. In this case, they might adopt an equal treatment strategy, providing the same amount of resources for each child at every point in time (Hertwig et al., 2002).

In addition to these theories, the predictions can be developed on the basis of the relative risk aversion mechanism and the differences in parenting styles (Duta et al., 2021). The relative risk aversion mechanism suggests that upper-class families have a stronger interest in providing support and motivating their children to attain higher levels of education in order to make them preserve their social position. In addition, parents in advantaged families tend to adopt more strict, planned, and intentional parenting practices, referred to as "concerted cultivation", while lower-class parents follow a "natural growth" strategy, spending less time with their children and not structuring their

activities (Lareau, 2003). Both arguments lead to a prediction of greater sibling similarity in better-off families.

Empirical evidence on the variation of sibling correlations by family socioeconomic background is mixed, with some studies corroborating the existence of differences (e.g., Conley et al., 2007; Conley & Glauber, 2008; Grätz et al., 2021) and others finding no heterogeneity (e.g. Duta et al., 2021; Grätz, 2018). A recent cross-country comparative study suggests that there is greater socioeconomic variation in sibling correlations in school grades and educational attainment than in cognitive skills (Grätz et al., 2021). Furthermore, the authors find that in the USA and Sweden, children in families with highly educated fathers resemble more in their school grades and educational attainment than children in families with low-educated fathers. However, the results for Norway and Finland are the opposite. On the other hand, the study using sibling data from the Scottish Longitudinal Study, found no heterogeneity of sibling correlation in obtaining higher education qualifications (Duta et al., 2021). At the same time, the authors note that the nature of this similarity is different across the socioeconomic backgrounds, namely children in advantaged families resemble in their outcomes because they both have a degree, while children in disadvantaged families are alike since neither of them has a degree.

3. Within-family analysis of educational inequalities: the role of birth order

Despite having the advantage of providing the most comprehensive measure of the impact of family background on life chances, sibling correlation does not allow examining whether the differences in individual characteristics lead to inequalities within families. Therefore, the estimation of sibling correlations should be complemented by family fixed-effects models, which permit investigating the influence of sibling differences in such characteristics as, for instance, birth order, birth spacing, maternal age at birth, and gender on the educational outcomes of interest. The main advantage of this method is that it controls for unobserved confounding variables, which are constant between siblings at the family level and in the environment, in particular characteristics of the parents, that are shared among siblings, the size of the sibling group, parental resources and parenting practices to the extent that is common among the children.

A large number of studies has analysed the relationship between birth order and such outcomes as educational attainment, intelligence test scores, and scores of educational achievement (Steelman et al., 2002). However, many of these studies produced conflicting results and faced the problems of model specification or unrepresentative samples (Härkönen, 2014; Kristensen & Bjerkedal, 2010). Indeed, empirical estimation of birth order effects is challenging for several reasons. First, it requires full control for family size, otherwise, birth order effects are confounded with sibship size. Second, the results might be biased by the presence of cohort effects in educational attainment and parental age, since later-born children belong to different cohorts compared to earlier-born siblings and the parents of first-borns are younger than parents of third- or fourth-born children. Third, birth order effects can be confounded by birth spacing, since the close spacing of births can negatively impact children's outcomes (Powell & Steelman, 1993). Finally, conditional on parental and child cohort, birth order correlates with parental socioeconomic status and other, potentially unobserved, factors (Hauser & Sewell, 1985; Black et al., 2007). These challenges can be resolved by family fixed effects models, allowing to take into account observed and unobserved family characteristics, with controls for demographic differences between siblings and large representative data sets (Härkönen, 2014).

With respect to the intellectual outcomes, several theories have been put forward to explain the negative impact of birth order, including resource dilution theory, confluence model, and optimal stopping models. According to resource dilution theory, first-born children, on the one hand, have the advantage of being the only children for a longer time and benefit from less competition, especially during the sensitive early years. Later-born children, on the other hand, come in an environment where family resources, including attention and quality time spent with parents, must be shared with other children. This leads to systematically fewer inputs relative to their elder brothers or sisters (Downey, 2001; Price, 2008; de Haan et al., 2014).

The confluence model relies on the decline of the family's average intellectual environment due to the increase in the number of children and the interactions between siblings (Zajonc et al., 1979; Zajonc, 1976). According to Zajonc (1976), the intellectual development of a child depends on the intellectual environment in the family which is defined as the average of the intellectual levels of all family members. A first-born child

benefits from a rich intellectual environment in the sole presence of adults, while the following children are born into an intellectually depressed milieu. Consequently, one would expect a negative impact of birth order on the cognitive outcomes of the siblings. In addition, it is also important to take into account the interactions between the siblings (Zajonc et al., 1979). Younger children learn from their more mature older siblings which would seem to make the former advantaged compared to the latter. However, in the long run, the teaching benefits the tutor more than the tutee (Zajonc et al., 1979). The relative importance of the tutoring effect compared with that of the intellectual environment effect increases over time so that at around the age of 11 ± 2 years and further older siblings become smarter than younger ones (e.g., Zajonc, 2001; Zajonc & Sulloway, 2007). Other studies have shown that the negative birth order effect is manifested already around the age of 10 (Bonesranning & Massih, 2011).

The optimal stopping model takes into account not only the quality of childhood experience but also parents' fertility behaviour (e.g., Black et al., 2005). The key assumption of this model is that parents make their fertility decisions based on their experience with previous children. Parents with one child will have further children only in case of a positive experience with the first one. They will stop having more children when facing difficulties with their latest child. Therefore, on average, the last child in a family is expected to have weaker performance and worse behaviour, while the first-borns with younger siblings are a positive selection from all children born first to their parents (including only children) and are therefore likely to show better school results.

The negative relationship between birth order and cognitive outcomes can also be explained by the different characters of the siblings. First-borns are performing better at school due to certain characteristics that are helpful in the educational system. Older children gain their parents' favour by acting as a tutor and carer for their younger brothers and sisters, which implies that they are expected to be more conscientious, hard-working, and respectful of authority. Younger children, on the other hand, attract their parents' attention by experimentation and are often more ingenious, unconventional, and tolerant of risk (e.g., Paulhus et al., 1999; Sulloway, 2001). Moreover, first-born children tend to employ dominating strategies, while their younger counterparts mainly use low-power strategies (e.g., appealing to parents for help, humour, and social intelligence) (e.g., Paulhus et al. 1999; Sulloway 2001). These discrepancies later result in differences in

personality and social behaviour. The role of personality traits in explaining socioeconomic outcomes has been corroborated by the economic literature (Heckman et al., 2006; Borghans et al., 2008).

The existing agreement on a firm correlation between cognitive ability and educational attainment (Deary et al., 2007, Mackintosh, 1998) might lead one to expect that higher birth order would result in lower levels of education. However, the relationships between birth order, intelligence, and educational attainment might not be that straightforward due to parental investment strategies. As already mentioned in the previous section, parents may either invest optimally in their children's human capital directing their resources to the better-endowed children (Becker & Tomes, 1979; 1986), or may seek to equalize their children's attainment by providing more resources to the weaker child (Behrman et al., 1982; Bernardi, 2012), or may simply choose to provide the same amount of resources for each child at every point in time (Hertwig et al., 2002). Whether birth order effects are reinforced or compensated may depend on the parental resources. In particular, better-off families might be more likely to adopt compensatory strategies by investing more in the offspring having fewer chances for success in education (Conley, 2004, 2008; Griliches, 1979). However, whether these expectations apply to birth order differences is uncertain. The study using sibling data from the German Life History Study and fixed-effects models shows that birth order has a strong negative effect on educational attainment in West Germany but these effects do not vary according to families' socioeconomic characteristics (Härkönen, 2014). Similarly, Black et al. (2005) find a significant and large negative effect of higher birth order on children's education in Norway and no substantial differences by parental education. On the contrary, the study using the data from the German Socio-Economic Panel Study and family fixed-effects models shows that the negative effects of higher birth order on educational attainment are reduced in socioeconomically advantaged families, which provides evidence for compensating strategies adopted by socioeconomically advantaged parents (Grätz, 2018).

If parents assess the benefits of attaining education differently for boys and girls, the effect of birth order may vary by gender. Kristensen and Bjerkedal (2010), using a Norwegian register-based longitudinal study, find that female educational advantage over males increases for the later birth cohorts, and the birth order effect is slightly stronger for women than for men. Another Norwegian study by Black et al. (2005) confirms larger

birth order effects for women with respect to not only educational attainment but also full-time employment. However, two German studies (Härkönen, 2014; Eschelbach, 2015) find stronger birth effects for boys. The results for Germany were explained by lower educational returns for women. The strong male breadwinner tradition with a poor public childcare provision has constrained women in West Germany to choose between working and staying at home and undermined the incentives for prolonged education.

4. Gender and within-family differences in educational outcomes

While recent studies provide consistent evidence regarding the effects of birth order on siblings' educational outcomes, the role of gender is not clear both in terms of theoretical expectations and empirical evidence. Gender might be considered as one of the factors guiding the allocation of parental resources within the family and ultimately affecting educational outcomes. Theoretical discussions in the literature have mainly focused on the amount of education attained. The models of the family developed by Becker and Tomes (1979, 1986) and Becker (1991), in which parents invest in their children's human capital based on the expected costs and returns of education, can also be applied when considering the gender of children. Empirical evidence consistently shows that men have better chances of labour market success in terms of hiring, pay, and promotion outcomes, as well as longer careers, compared to women (Correll et al., 2007; England, 1992; Blau & Kahn, 2000). Thus, parents, expecting higher rates of return to education for boys, will invest more in the schooling of a male child. As a result, girls with brothers will have less education than girls with sisters. Similarly, boys who grow up only with brothers will have worse educational outcomes than men who have sisters. Assuming that educational decisions are taken one after another, girls with older brothers will be most disadvantaged, as available resources might have already been spent. Furthermore, within-family gender effects are expected to be more pronounced in lower-SES families who are more credit-constrained, compared to upper classes who can afford higher education for any child in the family. Finally, as suggested by Kalmijn & Van De Werfhorst (2016) this gendered allocation of resources within a family might be more typical for societies with a conservative gender climate than for countries with more gender-egalitarian labour markets and gender-egalitarian ideology.

An alternative theoretical approach implying that parents tend to avoid inequalities among their children (Behrman et al., 1982) would lead to an opposite prediction. That is, parents will invest more in the human capital of girls who are expected to have lower returns in the labour market, in order to offset any inequalities between siblings. Therefore, the presence of a brother will be positively associated with the educational attainment of girls, while the presence of a sister will harm educational outcomes. Given that advantaged families are more likely to adhere to gender-egalitarian ideology (Thornton & Freedman, 1979; Thornton et. al., 1983) and do not face budget constraints in adopting compensating strategies, one might expect higher parental socioeconomic background to be associated with less educational inequality between opposite-sex siblings.

Besides economic theories, sociological literature provides several explanations for the effects of sibling gender. Rosenberg's (1965) "sex minority hypothesis" implies that the child who is the sex minority in a family will receive special treatment from parents, thus obtaining relatively better educational outcomes. This theory leads to an expectation that a girl having only brothers fairs better than a girl raised only with sisters. In contrast, Conley's "revised sex minority hypothesis" argues that it is more disadvantageous to have siblings of the opposite sex since "same-sex siblings may stimulate a competitive, achievement-orientated environment among children, while opposite-sex ones may engender a more sociable, less aggressive environment" (Conley, 2000: 445). Another explanation of gender effects is offered by the reference group theory, according to which the sibling sex composition adjusts parents' preferences for equality of child outcomes. In a family with one son and one daughter the achievement of both children is measured on the same scale, which results in equal investments in their education. However, the birth of a second female child would change the reference group for the first daughter, who would now be measured against her newborn sister rather than her brother. Therefore, girls who are the only daughter among brothers are expected to have better educational outcomes than those who have at least one sister.

The empirical studies on sibling gender effects provide mixed evidence. Powell and Steelman (1989) found that having brothers is negatively associated with receiving parental financial assistance, whereas the number of sisters has no significant effect. In contrast, Butcher and Case (1994) reported that women who grow up with sisters have

less education than women raised with brothers. However, for males, the presence of sisters has no significant impact on education. Kaestner (1997) replicated Butcher and Case's analysis in several ways but also took into account race and family budget constraints. The author found no evidence of sibling sex composition effects for White individuals but reported greater levels of educational attainment for black adults raised with a sister or having relatively more sisters than black adults with no or few sisters. In addition, the study did not reveal any differences in sibling sex composition effects by family income. Jacob (2011) using data from the German Life History Data, showed that it is not the presence of brothers as such that matters for the educational attainment of girls, but their relative age, which supports the assumption that families make sequential decisions regarding schooling investments of their children. Namely, she found that older brothers have a negative influence on their sisters' chances of graduating from higher education, in particular in working-class families. At the same time, in service-class families, older brothers seem to be beneficial for younger sisters' educational attainment. Furthermore, the author points out that, in total, educational outcomes are independent of the sibling sex composition. No evidence of the sibling sex composition effect is also found by Hauser and Kuo (1998), Bauer and Gang (2001), and Amin (2009). To sum up, the literature on the role of gender in siblings' educational outcomes does not offer consistent evidence.

5. Sibling influence in the choice of major

The studies on sibling influence in the choice of major are very scarce. The social learning theories (Bandura, 1977; Patterson, 1984) argue that individuals learn new behaviours through the observation of others (models). One of the crucial factors of whether a model will attract another person's attention is the frequency of contact with the model. Since siblings spend considerable time together, they are likely to become models for each other. For example, with respect to educational choices, an individual can receive precious and otherwise costly information about the costs and benefits of alternative institutions and fields of study. Another determinant of a model is the possession of such characteristics, as nurturance, power, and mastery (Bandura, 1977). These characteristics are more likely to be found in older siblings rather than younger ones, as older siblings tend to have more skills and knowledge, and are more likely to provide directions, advice,

support, and care for their younger brothers or sisters (Azmitia & Hesser, 1993). This might suggest that younger siblings are more likely to choose a similar field of study as their older siblings when they differ more in age, and the higher is the level of education of the older siblings (Vleuten et al., 2020). Furthermore, a child is more likely to imitate those people he/she perceives as similar to himself/herself. Therefore, an individual is more likely to follow the example of a sibling having the same gender (Rowe & Gulley, 1992; Whiteman et al., 2011).

Very few studies analysed the sibling influence on the choice of major or field of study. Moreover, their results are mixed. Exploiting discontinuous admission rules in Chile's higher education system, Aguirre and Matta (2021) find that having an older sibling enrolled in a given college increases by 42% the probability of enrolling in that institution. However, the authors reveal no effect on major choices. Furthermore, they show that spillovers are especially concentrated among siblings who are expected to attend the same college campus at the same time, which they consider as an indication that spillovers may be driven by siblings' desire to spend time together in college, or by their need to share some of the costs of attending college.

On the other hand, Vleuten et al. (2020), using the data from the fifth wave of the Children of Immigrants Longitudinal Survey in the Netherlands and applying conditional logit models, show that younger siblings follow their older sibling's fields of study, especially when they are of the same sex. The authors find no evidence that sibling similarities are dependent on differences in age or education level of the older sibling. Joensen and Nielsen (2018), exploiting the exogenous variation in course choice stemming from a pilot program in Denmark's high school, show that younger siblings are 2-3 percentage points more likely to choose math-science if their older sibling unexpectedly could choose math-science at a lower cost. Furthermore, these spillovers are greater among closely spaced siblings, in particular brothers, and have a long-term impact on the career outcomes of younger brothers.

Finally, the study analysing the data on families with at least two children attending a college-preparatory high school in Milan, reports that mixed-gender siblings are associated with a stronger gender-stereotypical specialization of males in the choice of college major (Anelli & Peri, 2015). Namely, boys who have at least a sister attending a college-preparatory high school are 5 percentage points more likely to enrol in such fields

as, Economics/Business, Engineering, compared to boys with only brothers. The effect is weaker and not significant for girls. At the same time, the study shows that the gender composition of siblings does not influence the choice of track at the upper-secondary level. The authors argue that this decision, taken at a younger age, is influenced by parents, and is mainly the function of geographical proximity to a specific school and the gender of the first child. This suggests that the choice of college major reflects more the preference of the students rather than of their families as opposed to the choice of high school track.

6. Italian context

6.1 Inequality of educational opportunities in Italy

In the twentieth century Italy, like other economically developed countries, witnessed a notable increase in school participation. In the period between the 1950s and 1960s, known as *miracolo economico* or economic boom, there were significant changes in Italian society: the increase of white collars and blue collars and the reduction of the agricultural class. These changes were accompanied by considerable urbanisation, an increase in the number of schools, advancement in the system of public transport and improvement of living conditions, and the growth of consumption (Panichella & Triventi, 2014). In addition, the share of illiterate individuals declined, while the average years of education attained increased.

Several studies that examined the long-term trends in the relationship between social origin and education found a decline in social inequality in educational attainment in the 20th century (Ballarino et al., 2009; Barone et al., 2010). However, it is important to note that this decline was not uniform in several aspects. First, it was mainly related to the cohorts schooled in the 1950s and 1960s during the period of economic boom, while it seems to have exhausted itself subsequently, starting from the 1970s (Triventi, 2014). Second, the reduction in educational inequalities in the 1960s was more pronounced in central-northern regions rather than in the southern regions due to the higher enrolment rates in upper secondary schools in the Centre-North compared to the South (Ballarino et al., 2014). This discrepancy was related, on the one hand, to the systematic lack of school structures in the southern regions (Perri, 1971), on the other hand, to the differences in

educational paths of lower-class children. The Central-northern regions were characterized by higher percentages of working-class students continuing upper secondary education by enrolling in vocational schools rather than dropping out at the end of lower school as happened in southern regions (Panichella, 2014). Finally, the decline of social inequalities in educational attainment was quite moderate, mostly affecting lower school levels and, to a lesser extent, tertiary education (Ballarino & Schadee, 2010; Checchi et al., 2008; Shavit & Westerbeek, 1998; Triventi & Trivellato, 2009).

6.2 Italian upper secondary school

Today's Italian education system is the result of a major comprehensive reform adopted in 1962 that replaced the former system with a new middle school (*scuola media unica*, the actual lower secondary school) and changed the age at first tracking from 11 to 14. Therefore, after completing lower secondary education, the students are faced with the choice among three five-year tracks: academic schools (*licei*), technical schools (*istituti tecnici*), and vocational schools (*istituti professionali*). All three tracks afford a high school diploma that ensures access to university but differ in terms of subjects, academic standards, institutional purposes, and prestige. Teachers provide a recommendation for track choice that is not binding but taken into account by families (Argentin et al., 2017). Given the young age of children and the lack of standardized assessments of skills, parents play an important role in the transition from lower secondary to upper secondary school (Aastrup, 2007; Cavalli & Facchini, 2001).

Lyceums (*licei*) focus on the transmission of general knowledge and reasoning skills with instructional time mostly devoted to reading and comprehension, Italian literature, Latin, and philosophy. The teachers in these schools are on average better qualified and more experienced (Abbiati et al., 2017; Argentin, 2018), while the students are characterized by higher performance levels and lower problems of discipline (Gasperoni, 1997). Furthermore, nine out of ten graduates in academic schools continue to university education (Barone et al., 2018). Academic track includes five main types of curricula: classical (*liceo classico*), scientific (*liceo scientifico*), foreign languages (*liceo linguistico*), socio-psychological (*liceo psico-socio pedagogico* and *liceo delle scienze umane*) and art studies (*liceo artistico, liceo musicale e coreutico*). The first two programs

are the most prestigious and demanding and are largely attended by better-performing students from advantaged families (Scotto di Luzio, 2007). The other three curricula focus on humanistic subjects and are characterized by female overrepresentation and greater heterogeneity in terms of students' social backgrounds.

Vocational track (*istituti professionali*) provides training in the areas of service, industry, and craft sectors. The programs in these schools do not include apprenticeships, practical skills are mainly taught via simulations and laboratory activities (Abbiati et al., 2017). Vocational schools are characterized by the overrepresentation of low-performing students from immigrant and native low-educated families (Azzolini & Barone, 2012).

Technical schools occupy an intermediate position between academic and vocational tracks. While offering training for specific occupations, they have a stronger focus on the transmission of general skills compared to vocational schools. Technical schools are attended by students with higher prior academic performance than vocational schools, and their graduates are significantly more likely to enrol in university programs and complete them (Ballarino & Panichella, 2016; Contini & Scagni, 2013). Largely, the curricula of both vocational and technical schools can be divided into two main clusters: industry- and service-oriented. The former typically prepares students for skilled, blue-collar occupations, while the latter is oriented towards catering and tourism, accounting, and other white-collar jobs.

Starting from 2007 education in Italy has become compulsory up to 16 years of age, however, the incidence of early school leaving (especially in the first year of the upper secondary level) remains relatively high compared to many other European countries. In accordance with the recent Eurostat estimates, 13% of the Italian population aged 18 to 24 have not obtained an upper-secondary diploma, including certificates from vocational training. Among the European Union countries, only Malta (16.7%), Spain (16%), and Romania (15.6%) exhibit higher rates of early school leavers (Eurostat, 2020). Boys are more likely than girls to drop out early and these gender differences are greater among the students whose parents did not attain an upper-secondary certificate themselves (Borgna & Struffolino, 2017). The gender effects are partially mediated by scholastic performance and are stronger among low-achieving students, which implies higher resilience of girls to academic failure.

6.3 Social-origin stratification and gender segregation in upper secondary school in Italy

Despite the educational expansion and the resulting reduction of inequality of educational opportunities in upper secondary school enrolment in Italy, social inequality is “effectively maintained” (Lucas, 2001) via the association between socioeconomic background and track choice that was found to be stronger than in other European countries (Checchi & Flabbi, 2013; Contini & Scagni, 2011). Several studies have shown that academic tracks are more likely to be attended by children from advantaged families, while technical and vocational schools are often attended by lower social class children who perceive it as a fast track to enter the labour market and get valuable job-specific skills (Panichella & Triventi, 2014; Gambetta, 1987; Guetto & Vergolini, 2017). Moreover, the impact of social origin on the choice of school track persists when controlling for previous scholastic achievement (Contini & Scagni, 2013). This stratification has further important implications, as it has been shown that the type of diploma obtained at the upper-secondary level strongly affects subsequent educational transitions and labour market outcomes (Cappellari, 2004). Although all three types of upper secondary schools provide access to the tertiary level of education since 1969, the proportion of students enrolled in university changes according to the track. Graduates from academic tracks have a higher probability of enrolling at university compared to those who attended technical and vocational schools (Ballarino & Panichella, 2014, 2015). In addition, the holders of academic diplomas enjoy greater chances of getting skilled jobs, better-paid occupations, and lower risks of being outside employment. These occupational advantages persist even when adjusting for tertiary educational attainment and when restricting analyses to individuals without a university degree (Barone et al., 2021).

With respect to gender differences, the evidence shows that females are less likely to enrol in vocational and technical schools (Pisati, 2002; Mocetti, 2012). Within the academic track, girls are underrepresented in scientific programs and overrepresented in foreign languages and socio-pedagogic curricula. Within technical and vocational tracks, girls are less likely to be enrolled in industry-oriented curricula and are more likely to follow service-oriented curricula (tourism, catering, accounting, etc.). At the university level, these upper-secondary school gendered patterns account for almost two-thirds of the differences between males and females in access to the humanities and social sciences,

and almost one-third of the gender gap in engineering and computing fields enrolment (Barone & Assirelli, 2020). Further, this segregation brings less advantageous labor market prospects for women with respect to income, unemployment rates, and the risks of overeducation and skill mismatch, which are the outcomes found to be associated with humanities and the social sciences, as opposed to engineering and computing, medicine, and the other health-related fields (Assirelli, 2015; Barone & Ortiz, 2011; Davies & Guppy, 1997; Reimer et al., 2011).

7. Empirical strategy and expectations

In the first step of the analysis, sibling correlation on upper secondary school enrolment is quantified and its heterogeneity by family socio-economic background is analysed. Most of the existing studies using sibling correlations to analyse educational inequalities have concerned years of education attained (e.g., Björklund & Jäntti, 2012; Conley & Glauber, 2008; Sieben et al., 2001), for which the results range from 0.38 to 0.60. A recent study focusing on the probability of obtaining a university degree in Scotland found that about 40% of the variation in this outcome is related to siblings' shared family characteristics (Duta et al., 2021). Given that the effects of social background tend to diminish across educational transitions (Mare, 1980), it might be expected that sibling correlation in upper secondary school enrolment is at least not less than sibling correlation found with respect to years of education and probability of obtaining a university degree. The only study related to upper secondary school showed that 0.51 of the variation in upper track (Gymnasium) attendance in Germany at age 16-17 is explained by the family background (Grätz, 2018). Concerning the heterogeneity of sibling correlation by socioeconomic background, theoretical expectations point to greater similarity within advantaged families, although empirical evidence provides mixed results. Therefore, no specific hypothesis is formulated regarding the variation of sibling correlation in upper secondary school enrolment by parental education (used as an indicator of socioeconomic background).

Further, sibling similarity is measured with respect to the probabilities of enrolment in science/industry-oriented curricula within the three tracks, that is *liceo scientifico* and *liceo scientifico-tecnologico* within the academic track, industry-oriented curricula within the technical and vocational tracks (conditional on upper secondary school

enrolment). No previous studies on the choice of track or major applied the sibling correlation approach. However, since the decision regarding the track and the curricula is made at an early age (14 years), the influence of parents is expected to be substantial and not lower than the role of individual characteristics.

In the second step, within-family gender differences in the probability of upper secondary school enrolment, as well as in the choice of curricula are analysed. Previous empirical evidence based on between-family analysis shows that in Italy boys are more likely than girls to drop out early from school (Ballarino et al., 2011; Borgna & Struffolino, 2017). These gender differences might be related to performance results and behavioural factors. Girls tend to have higher grades than boys (Buchmann et al., 2008), and grades play an important role in students' educational transitions (Jackson, 2013; Stockè, 2007). Moreover, girls tend to be more self-disciplined, attentive, and interested in learning, whereas boys are more likely to display disruptive behaviors and less positive attitudes towards school (Buchmann et al., 2008). These differences might contribute to the female advantage through teacher's assessments and facilitation of the learning process.

With respect to the parental background, it is expected that gender differences in upper secondary school enrolment are particularly pronounced within disadvantaged families. Upper-class parents have more economic, cultural, and informational resources at their disposal to provide education-specific support to their offspring. In addition, they are closely involved in the study process of their children through constant conversations with them, as well as through structuring and monitoring their activities (Lareau, 2003). The lack of parental support in lower-class families might be particularly influential for boys, who are more likely to face both academic and relational difficulties at school.

No previous studies using the within-family approach have focused on the choice of major or school track. It is well-known that within the academic track, girls are less likely than boys to choose the scientific curriculum and are more likely to study foreign languages and socio-pedagogic programs. In technical and vocational tracks, females are underrepresented in industry-oriented curricula and are overrepresented in service-oriented curricula (tourism, catering, accounting, etc.). Since family influence is strong at the early stages of education, within-family gender differences might be lower (but not negligible) than between-family gender differences. Even if boys and girls belong to the

same family, inequalities in the choice of major or school track might persist as a result of socialization processes. Through daily interactions parents might implicitly reinforce society-wide gender norms and beliefs, affecting children's attitudes to mathematics (Good et al., 2012; Parker et al., 2014) and preferences about labour market and family involvements (Barone, 2011; Busch-Heizmann, 2015; DiPrete and Buchmann, 2013), making boys and girls take different educational and labour market paths (Jacobs, 1995).

Given that advantaged families are more likely to adhere to gender-egalitarian ideology (Thornton & Freedman, 1979; Thornton et. al., 1983) and do not face budget constraints in adopting compensating strategies, it is expected that gender differences in the probability of enrolment in the scientific curriculum rather than humanistic within the academic track are less pronounced in families where parents have tertiary education compared to the families with lower educated parents. Concerning the technical and vocational tracks, enrolment in these educational paths is highly unlikely for children from advantaged families and is associated with downward mobility. Therefore, the decision about the curriculum for upper-class families might be influenced more by an inclination to buffer already unsuccessful choices rather than by gender connotations (Prix & Kilpi-Jakonen, 2022). As a result, both girls and boys from families with highly educated parents might be less likely to choose industry-oriented curricula leading to blue-collar manual occupations and more likely to follow female-dominated paths linked to care and service occupations. For men and women from lower classes, vocational and technical tracks represent a way of maintaining their social origin positions, thus the choice between male- or female-dominated curricula from the point of view of social mobility might be less relevant. Given these considerations, it is expected that also in the case of technical and vocational tracks, gender differences in the probability of choosing a male-dominated (industry-oriented) curriculum are less pronounced within families with highly educated parents than within families with lower-educated parents.

Further, the analysis proceeds with the investigation of whether gender differences in educational outcomes vary by birth order. In accordance with the Matthew effect described by Merton (1968), one might expect the accumulation of disadvantage for later-born boys in terms of upper secondary school attainment and for later-born girls in terms of the probability of enrolling in science/industry-oriented programs. In line with these predictions, two German studies found stronger birth order effects for boys in terms of

the probability of completing higher secondary education (Eschelbach, 2015) and years of education (Härkönen, 2014). On the contrary, other studies showed that the negative impact of birth order on educational attainment was more pronounced for women than for men (Black et al., 2005; Kristensen & Bjerkedal, 2010).

Birth order effects might also vary by parental background. Better-off families might adopt compensatory strategies by investing more resources in a child having fewer chances for success in education (Bernardi, 2012), that is, by providing more support to a later-born girl willing to enrol in a science/industry-oriented program or to a later-born boy during his studies at upper secondary school. Therefore, birth order effects might be weaker in these families compared to the disadvantaged ones. In accordance with these expectations, a study using German Socio-Economic Panel data and family fixed-effects models, revealed that the negative effects of higher birth order on educational attainment are reduced in socioeconomically advantaged families (Grätz, 2018). However, other studies found no heterogeneity in the impact of birth order by families' socioeconomic characteristics (Härkönen, 2014; Black et al., 2005).

In the final step, the interacted impact of one's birth order and sibling gender composition on educational outcomes of boys and girls is analysed. On the one hand, social learning theory suggests that individuals having siblings of the same gender are more likely to follow their example. On the other hand, some findings show no influence of sibling gender composition on the choice of track at the upper-secondary level (Anelli & Peri, 2015), which might be related to the fact that such a decision reflects more the influence of parents who want their children to study in the same school, independently of the gender of siblings, rather than the individual preferences of the students. Therefore, no specific expectations are formulated for this step of the analysis.

8. Data and methods

The analysis is based on the data from the Italian labour force survey 2005-2020. The analytical sample includes 11,443 households with two and three children aged 15-17 years. The total number of observations in the sibling sample is 23,022.

The first dependent variable, measured on the whole analytical sample, is a dummy coded one for children enrolled in upper secondary education (*scuola superiore di 4-5 anni*) and zero otherwise. The second group of dependent variables is measured on the

subsamples related to the three tracks (academic, technical, and vocational) conditional on upper secondary school enrolment: dummy coded one for those who attend scientific curriculum and zero for those who attend humanistic or artistic curricula within the academic track, dummy coded one for those who follow the industry-oriented curriculum and zero for those who follow service-oriented curriculum within the technical track, dummy coded one for being enrolled in industry-oriented curriculum and zero for being enrolled in the service-oriented curriculum within the technical track.

Sibling similarities in educational outcomes of interest are estimated through the intraclass correlation coefficients (ICCs) obtained from restricted maximum likelihood (REML) multilevel models (Björklund & Jäntti, 2012; Mazumder, 2008; Schnitzlein, 2014) in which individuals (i) are nested within the families (j):

$$Y_{ij} = X_{ij}\beta + \varepsilon_{ij}, (1)$$

where E_{ij} is the educational outcome of interest, X_{ij} is the gender control, and ε_{ij} is the error term that can be decomposed into family-specific (α_i) and individual-specific (δ_{ij}) components under the assumption that the covariance between these two parts is 0:

$$\varepsilon_{ij} = \alpha_i + \delta_{ij} (2)$$

The intraclass correlation coefficient obtained from this model is computed as follows:

$$ICC = \sigma^2_{\alpha} / (\sigma^2_{\alpha} + \sigma^2_{\delta}), (3)$$

where σ^2_{α} is the variance between the families and σ^2_{δ} is the variance within the families. ICC, thus, shows how much of the total variance ($\sigma^2_{\alpha} + \sigma^2_{\delta}$) is shared by the siblings.

The linear probability model in the case of this study is preferable to the logistic model, as it provides a non-parametric estimate of the ICC (Breen & Ermisch, 2021). To estimate the heterogeneity of sibling correlation on upper secondary school enrolment across socioeconomic backgrounds, the ICCs are computed on the subsamples restricted to the following groups of parental education operationalized using the dominance principle:

lower-secondary or less, upper secondary, tertiary. The multilevel models control only for gender.

It is important to note that since the response variables in this study are binary, the ICC estimates for different subsamples depend not only on the within-family variation but also on the mean probability of the outcome (Breen & Ermisch, 2021). Therefore, for a better understanding of the results, the following statistics are computed and reported: the proportion of families in which all siblings have the same outcome, the proportion of families where all siblings have the outcome equal to 1 among those where siblings have the same outcome.

Gender differences in educational outcomes within the families are estimated via linear probability models with family fixed-effects and cluster-robust standard errors, controlling for birth order. These models allow analysing educational inequalities within the families between males and females, controlling for the factors that remain constant within the sibling group, such as sibling group size, parental resources, as well as unobserved factors related to the family background, e.g., parenting styles. To estimate whether within-family gender effects differ by birth order, the models with interaction terms are applied. Furthermore, fixed-effects estimates are computed on the subsamples restricted to the groups of parental education in order to analyse their heterogeneity. Finally, together with the fixed-effects estimates, between-family estimates from linear probability models are reported based on the sample comprising also the households with one child of 15-17 years (232,044 observations). Linear probability models estimated on the larger sample control for birth order, parental education, number of children in the household, and the region of residence.

In the final step of the analysis the differential impact of sibling gender composition interacted with birth order on educational outcomes of boys and girls is estimated. For this purpose, a variable with nine categories based on all possible combinations of birth order (first-born, second-born, or third-born) and gender composition of all individual's siblings (all male, all female, mixed gender), including those siblings that are outside of the analytical sample (that is, the siblings of the age different from 15-17 years), is created and interacted with the gender of an individual. It is important to note that the gender of siblings has a well-documented effect on subsequent fertility and, therefore, on family size. Ben-Porath and Welch (1976) showed that 56 percent of families where the first two

children were of the same gender (two boys or two girls) decided to have a third child. In contrast, only 51 percent of families with one boy and one girl had a third child. This means that the number of children, as well as gender composition in families with three or more children, is endogenous. For this reason, a separate estimation of an interacted effect of birth order and sibling gender composition is made on a sample of families with only two children in total. In this case, the variable of interest has only four categories: first-born individual having a brother, second-born individual having a brother, first-born individual having a sister, and second-born individual having a sister.

9. Empirical evidence

9.1 Descriptive statistics

Table 2 shows descriptive statistics with respect to the main analytical sample. Female children are 4.8 p.p. more likely than male children to be enrolled in upper secondary school at the age of 15-17. Concerning family background, almost all children (96%) whose parents have tertiary education attend upper secondary school, while among those whose parents have only lower secondary education or less the share of upper secondary school attendees is 74.6%. Around half of the pupils (51.7%) attending upper secondary school are enrolled in the academic track, which is more likely to be chosen by girls rather than boys (63.8% as opposed to 39.6%). At the same time, boys are 19.4 p.p. and 4.8 p.p. more likely than girls to follow technical and vocational tracks respectively. The majority of advantaged students (84%) attend the academic track, while technical and vocational tracks are more likely to be chosen by children having lower-educated parents.

Within each track, strong gender segregation can be found, with boys being overrepresented in scientific programs of academic curricular and industrial, agricultural, and IT curricula of technical and vocational tracks, and girls being overrepresented in humanistic, artistic, and service-oriented programs. With regard to parental background, it can be noted that children whose parents have tertiary and upper secondary education are 18 p.p. and 11.8 p.p. respectively more likely to be enrolled in scientific programs than students with lower educated parents, and 17.4 p.p. and 5.7 p.p. respectively more likely to attend *liceo classico* compared to children from disadvantaged families. Within

technical and vocational tracks, segregation of the programs by parental background is very limited.

Table 2 - Descriptive statistics, column percentages.

	By gender		By parental education			Total
	male	female	lower secondary or less	upper secondary	tertiary	
1) Upper secondary school enrolment						
Enrolled	83.2	88.0	74.6	90.2	95.9	85.5
Not enrolled	16.8	12.0	25.4	9.8	4.1	14.5
<i>N of observations</i>	<i>11,893</i>	<i>11,129</i>	<i>8,398</i>	<i>10,637</i>	<i>3,987</i>	<i>23,022</i>
2) Choice of track (conditional on upper secondary school enrolment)						
Academic	39.6	63.8	29.9	52.9	84.0	51.7
Technical	40.6	21.2	40.8	32.1	11.9	30.9
Vocational	19.8	15.1	29.3	15.0	4.1	17.4
<i>N of observations</i>	<i>9,851</i>	<i>9,755</i>	<i>6,223</i>	<i>9,567</i>	<i>3,816</i>	<i>19,606</i>
3) Choice of the curriculum within each track						
3.1) Academic track						
Scientific curriculum	68.5	35.9	36.9	48.7	54.9	48.5
<i>Liceo classico</i>	13.3	18.4	8.1	13.8	25.5	16.4
Other humanistic and artistic curricula	18.2	45.8	55.1	37.6	19.7	35.1
<i>N of observations</i>	<i>3,904</i>	<i>6,224</i>	<i>1,862</i>	<i>5,060</i>	<i>3,206</i>	<i>10,128</i>
3.2) Technical track						
Industrial, agricultural, IT and other male-dominated curricula	66.9	21.1	49.4	51.8	56.8	51.1
Service-oriented curricula (e.g., tourism, social services, commerce)	33.1	79.0	50.6	48.2	43.2	48.9
<i>N of observations</i>	<i>3,071</i>	<i>1,620</i>	<i>2,066</i>	<i>2,310</i>	<i>315</i>	<i>4,691</i>
3.3) Vocational track						
Industrial, agricultural, IT and other male-dominated curricula	43.3	13.6	31.0	30.6	34.1	31.0
Service-oriented curricula (e.g., tourism, social services, commerce)	56.8	86.4	69.0	69.4	65.9	69.0
<i>N of observations</i>	<i>1,223</i>	<i>866</i>	<i>1,170</i>	<i>831</i>	<i>88</i>	<i>2,089</i>

Additional descriptive statistics with respect to the main analytical sample (comprising households with 2-3 children of 15-17 years) and a larger sample used for between-family analysis (comprising households with 1-3 children of 15-17 years) are shown in table 3.

Table 3 - Additional descriptive statistics, column percentages.

Variable	Sample for within-family analysis (main analytical sample)	Sample for between-family analysis
Gender		
Male	51.7	51.9
Female	48.3	48.1
Age		
15 years	37.4	33.1
16 years	24.4	33.2
17 years	38.2	33.7
Birth order		
First-born	41.9	57.9
Second-born	49.7	36.9
Third-born	8.4	5.2
Parental education		
Lower secondary or lower	36.5	35.9
Upper secondary	46.2	49.2
Tertiary	17.3	14.9
Total number of children in a family		
1	0.0	21.0
2	58.1	59.7
3	41.9	19.4
Number of children of 15-17 years in a family		
1	-	90.1
2	98.0	9.7
3	2.0	0.2
Siblings' gender composition (excluding an index person)		
All-female	37.7	33.1
All male	41.6	36.4
Mixed gender	20.7	9.5
<i>Only child</i>	-	21.0
Birth order and siblings' gender composition (excluding an index person)		
First-born, all-female siblings	16.7	16.1
Second-born, all-female siblings	18.9	15.7
Third-born, all-female siblings	2.2	1.3
First-born, all-male siblings	18.7	17.3
Second-born, all-male siblings	20.3	17.5
Third-born, all-male siblings	2.6	1.7
First-born, mixed-gender siblings	6.6	3.6

Variable	Sample for within-family analysis (main analytical sample)	Sample for between-family analysis
Second-born, mixed-gender siblings	10.5	3.7
Third-born, mixed-gender siblings	3.65	2.3
<i>Only child</i>	-	21.0
Number of observations	23,022	232,044

9.2 Sibling correlations: results from multilevel models

The first row of Table 4 shows the intraclass correlation coefficients (ICCs) obtained from restricted maximum likelihood (REML) multilevel models which represent sibling correlation on upper secondary school enrolment and its heterogeneity by parental education. Since the outcome of interest is binary, the ICC estimates for different subsamples depend not only on the within-family variation but also on the mean probability of the outcome (Breen & Ermisch, 2021). Therefore, for the purpose of comparative analysis, the following rows of Table 4 provide additional statistics, such as family-level variance, individual-level variance, the proportion of the families in which children have the same outcome, and the proportion of enrolled siblings among those who have the same outcome.

The ICC on upper secondary school enrolment indicates that 49% of the variation in the probability of this outcome is attributed to the family background. This result is in line with the sibling correlations on years of education reported in previous studies that range from 0.4 to 0.6. In addition, as expected, it is not less than the sibling correlation on the probability of obtaining a university degree - 40% for Scotland (Duta et al., 2021). While sibling similarity among the children whose parents have lower levels of education is close to the overall estimate of ICC, sibling correlations for the families where parents have upper secondary and tertiary education are lower: 0.42 and 0.32, respectively. The reason for this difference becomes clear if one compares the additional statistics reported in the table. The proportions of the siblings with the same outcome among the families with upper secondary and tertiary educated parents are very high, 90% and 95%, respectively.

Table 4 - Sibling correlation on upper secondary school enrolment and its heterogeneity by parental education (standard errors in parenthesis).

Statistic	Upper-secondary school enrolment	Upper-secondary school enrolment, by parental education		
		Lower secondary or less	Upper secondary	Tertiary
ICC	0.49 (0.007)	0.50 (0.012)	0.42 (0.011)	0.32 (0.020)
Level 1 (family) variance	0.061 (0.001)	0.094 (0.003)	0.037 (0.001)	0.012 (0.001)
Level 2 (individual) variance	0.063 (0.001)	0.094 (0.002)	0.051 (0.001)	0.026 (0.001)
The proportion of families in which children have the same outcome	0.87	0.81	0.90	0.95
The proportion of enrolled siblings among those who have the same outcome	0.91	0.80	0.95	0.99
Number of observations	23,022	8,398	10,637	3,987

Moreover, almost all of the siblings with the same outcome are both enrolled in upper secondary education: 95% among the families with upper secondary educated parents and 99% among the families with tertiary-educated parents. This means that there is very little variation in the probability of upper secondary school enrolment at the family level for these two groups. Indeed, the estimates of level 1 variance attributed to the family background are less than the estimate of level 2 variance attributed to an individual. Whereas in the case of the families with lower educated parents, the percentage of siblings among those who have the same outcome is less (81%), and both individual- and family-level variance is higher compared to the families with upper secondary and tertiary educated parents.

Table 5 - Sibling correlations on the choice of science/industry-oriented curricula within the three tracks, conditional on upper secondary school enrolment (standard errors in parenthesis).

	Scientific curriculum within the academic track	Industry-oriented curriculum within the technical track	Industry-oriented curriculum within the vocational track
ICC	0.33 (0.015)	0.47 (0.022)	0.54 (0.033)
Level 1 (family) variance	0.073 (0.004)	0.095 (0.005)	0.103 (0.008)
Level 2 (individual) variance	0.151 (0.003)	0.107 (0.004)	0.089 (0.006)
The proportion of families in which children have the same outcome	0.64	0.58	0.73
The proportion of enrolled siblings among those who have the same outcome	0.39	0.28	0.11
Number of observations	10,128	4,691	2,089

Table 5 reports sibling correlations on the choice of science/industry-oriented curricula within the three tracks, conditional on upper secondary school enrolment. The role of family background in the choice of a science/industry-oriented curriculum is the lowest in the case of those who attend the academic track. 33% of the variation in the probability of choosing the scientific orientation rather than humanistic or artistic within the academic track is attributed to the family, while in the case of the technical and vocational tracks the family-level variation constitutes 47% and 54% of the total variation respectively in the probability of being enrolled in the male-dominated (or industry-oriented) curriculum rather than female-dominated (or service-oriented) curriculum. This means that in the case of the curriculum choice within the academic track, there is more variation within the families due to the individual characteristics than between the families. Indeed, the individual-level variance is twice larger than the family-level variance. At the same time, with respect to this track, the proportion of both siblings enrolled in a science-oriented curriculum among the siblings with the same outcome is 39%, while in the case of technical and vocational tracks, these proportions are 28% and 11% respectively. Therefore, there is more sibling similarity in the case of the curriculum choice within the technical track than the academic track, but this similarity is based on a

greater proportion of families where both siblings are not enrolled in science/industry-oriented programs.

Table 6 reports the results from multilevel models on the choice of science/industry-oriented programs within each track, estimated separately for the three groups of individuals defined by parental education. The results show greater heterogeneity within the technical and vocational tracks rather than within the academic track. In case of the enrolment in industry-oriented programs of the technical track, relatively higher SCs are revealed for children having tertiary-educated parents (0.63). For this group, the weight of the family background (0.132) is greater compared to the role of individual characteristics (0.079). This result might be related to the fact that science/technical paths within the technical track include not only programs linked to blue-collar occupations but also programs for preparing surveyors (*geometra*) or information technology specialists (*informatica*), which might be considered attractive paths for the children from better-off families choosing the technical track. Furthermore, it is interesting to note that within the academic track, the weight of the family background on the choice of science-oriented curriculum seems to be similar for the least and the most advantaged families (0,34 and 0,35 respectively). However, the nature of these estimates is different. While in the case of the families with tertiary-educated parents, the majority of sibling groups (54%) are similar on the positive outcome (enrolment in science curriculum), most sibling groups among disadvantaged families (100-19%=81%) are similar on the negative outcome of not being enrolled in science-oriented programs.

Table 6 - Sibling correlations on the choice of science/industry-oriented curricula within the three tracks by parental education, conditional on upper secondary school enrolment (standard errors in parenthesis).

Statistic	Science curriculum within the academic track			Industry-dominated curriculum within the technical track			Industry-dominated curriculum within the vocational track		
	lower secondary or less	upper secondary	tertiary	lower secondary or less	upper secondary	tertiary	lower secondary or less	upper secondary	tertiary
ICC	0.35 (0.037)	0.30 (0.022)	0.34 (0.023)	0.52 (0.031)	0.41 (0.035)	0.63 (0.070)	0.57 (0.040)	0.52 (0.059)	0.45 (0.205)
Level 1 (family) variance	0.076 (0.009)	0.066 (0.005)	0.078 (0.006)	0.103 (0.008)	0.083 (0.008)	0.132 (0.021)	0.110 (0.010)	0.100 (0.014)	0.085 (0.043)
Level 2 (individual) variance	0.138 (0.003)	0.157 (0.005)	0.149 (0.005)	0.096 (0.006)	0.122 (0.007)	0.079 (0.014)	0.083 (0.007)	0.094 (0.011)	0.103 (0.038)
The proportion of families in which children have the same outcome	0.68	0.63	0.65	0.63	0.55	0.54	0.73	0.74	0.69
The proportion of enrolled siblings among those who have the same outcome	0.19	0.36	0.54	0.30	0.25	0.28	0.11	0.11	0.13
Number of observations	1,862	5,060	3,206	2,066	2,310	315	1,170	831	88

9.3 Results from within- and between-family models

Sibling correlations are useful to understand the overall impact of the family background, although they do not provide information on the inequalities that arise within the families due to the differences in individual characteristics of the siblings, such as gender. Therefore, in the next step of the analysis, family fixed-effects models are estimated with respect to the educational outcomes of interest (Tab.7 and Tab.8)¹.

Table 7 - Upper secondary school enrolment: results from the family fixed-effects models and between-family estimates.

	Within-family estimates		Between-family estimates	
	Beta coefficient for gender (ref. male)	Number of observations	Beta coefficient for gender (ref. male)	Number of observations
Upper secondary school enrolment	0.04*** (0.03 - 0.05)	23,022	0.04*** (0.036 - 0.041)	231,960
<i>By parental education</i>				
Lower secondary or less	0.05*** (0.03 - 0.07)	8,398	0.06*** (0.06 - 0.07)	83,290
Upper secondary school	0.04*** (0.03 - 0.05)	10,637	0.03*** (0.026 - 0.032)	114,234
Tertiary	0.01 (-0.005 - 0.02)	3,987	0.01*** (0.007 - 0.015)	34,436

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6 shows that girls are 4 percentage points (p.p.) more likely to be enrolled in upper secondary school than boys when all the common family-related factors are accounted for. Moreover, the gender differences are only pronounced within the families where parents have upper secondary or lower education, while in the families with tertiary-educated parents, these differences are non-existent, which is in line with the statistics reported on the sibling correlations. These results support the expectation of a greater vulnerability of boys compared to girls to socioeconomic disadvantages. The estimates obtained from family fixed-effects models do not differ substantially from between-family estimates computed on the sample including the households with 1-3 children of 15-17 years.

¹ Full tables (A1-A8) are provided in the Appendix to Chapter 2.

Table 8 - Enrolment in science/industry-oriented curricula within the three tracks: results from the family fixed effects models and between-family estimates.

	Within-family estimates		Between-family estimates	
	Beta coefficient for gender (ref. male)	Number of observations	Beta coefficient for gender (ref. male)	Number of observations
Enrolment in scientific curriculum within the academic track	-0.29*** (-0.32 - -0.26)	10,128	-0.31*** (-0.32 - -0.31)	103,400
<i>By parental education</i>				
Lower secondary or less	-0.38*** (-0.48 - -0.29)	1,862	-0.32*** (-0.34 - -0.31)	20,614
Upper secondary school	-0.25*** (-0.29 - -0.20)	5,060	-0.33*** (-0.34 - -0.32)	55,426
Tertiary	-0.32*** (-0.37 - -0.28)	3,206	-0.27*** (-0.28 - -0.26)	27,360
Enrolment in industry-oriented curricula within the technical track	-0.43*** (-0.48 - -0.38)	4,691	-0.45*** (-0.461 - -0.445)	49,831
<i>By parental education</i>				
Lower secondary or less	-0.34*** (-0.41 - -0.28)	2,066	-0.46*** (-0.47 - -0.45)	20,522
Upper secondary school	-0.52*** (-0.61 - -0.44)	2,310	-0.45*** (-0.46 - -0.44)	26,289
Tertiary	-0.41*** (-0.61 - -0.21)	315	-0.38*** (-0.41 - -0.34)	3,020
Enrolment in industry-oriented curricula within the vocational track	-0.28*** (-0.38 - -0.19)	2,089	-0.32*** (-0.33 - -0.31)	20,217
<i>By parental education</i>				
Lower secondary or less	-0.33*** (-0.45 - -0.21)	1,170	-0.33*** (-0.34 - -0.31)	11,343
Upper secondary school	-0.20** (-0.35 - -0.41)	831	-0.31*** (-0.33 - -0.29)	8,242
Tertiary	-0.63*** (-1.05 - -0.21)	88	-0.30*** (-0.37 - -0.24)	632

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The estimates of the probabilities of attending science/industry-oriented curricula within the three tracks obtained from the family fixed-effects models show that female disadvantage is more strongly pronounced within the technical track than within the

academic or vocational tracks (Tab. 8). Girls are 43 p.p. less likely than boys belonging to the same family to follow the industry-oriented curricula rather than services-oriented programs within the technical track, while in the case of the academic and vocational track the within-family female disadvantage is 29 p.p. and 28 p.p. respectively. Therefore, even if boys and girls share the same family background, their choices with respect to the curriculum differ significantly. It should also be noted that no substantial differences in the estimates on the choice of curricula are found between family fixed-effects models and linear probability models without fixed effects computed on the larger sample.

The gender divergence in the choice of the curriculum within the family might arise due to the differential treatment of parents and significant others who encourage girls and boys to follow different educational tracks and fields. Such influence partly reflects social control mechanisms operating through the gender-biased perception of the “natural” inclinations and preferences of students (Frank et al., 2008; Gabay-Egozi et al., 2015). It was found that expressive motivations related to preferences for school subjects and specific occupations mediate to a significant extent gender segregation in higher education (Barone & Assirelli, 2020). It is possible that these expressive preferences also have an impact on the earlier choice of the curriculum within the upper secondary track. Unfortunately, the data used in this study does not include information on parenting styles, teacher influences, and the students’ individual preferences, which does not allow for conducting a more detailed analysis.

With respect to the heterogeneity of estimates by parental education, the expectations of smaller gender discrepancies (although of a very limited magnitude) within advantaged families in the choice of curricula are confirmed only for the academic track. In the case of the technical and vocational tracks, female disadvantage in being enrolled in industry-oriented curricula is relatively lower within families with lower-educated parents than within families where parents are tertiary educated. However, it was expected that both girls and boys in advantaged families would avoid applying for industry-oriented programs leading mainly to manual blue-collar occupations and would prefer service-oriented paths in order to buffer already unsuccessful school choices, while for lower-class families the choice of the curricula within the technical track would be less relevant. This discrepancy between the expectations and empirical findings might be related to the fact that industry-oriented curricula in technical institutions also include programs for

preparing surveyors (*geometra*), business experts (*periti d'azienda*), IT specialists (*informatica*), and vocational schools include curricula for preparing programmers (*programmatori*), which could be considered promising options for the boys from better-off families.

Figures A1, A2, and A3 in the Appendix show the average predictions obtained from the family fixed-effects models with interaction terms between gender and birth order, as well as their heterogeneity by parental background. In terms of all the outcomes of interest, the interaction between gender and birth order is not statistically significant and the effect has a very limited (almost negligible) magnitude. These results hold also when the heterogeneity by parental education is estimated. Therefore, the impact of gender on upper secondary school enrolment and the choice of an industry-oriented program is unlikely to vary by birth order.

It might be that educational outcomes depend on the gender composition of the siblings and relative standing of a child in this constellation, rather than on a child's gender and birth order. To test this assumption, the interacted impact of birth order and siblings' gender composition on the educational outcomes of boys and girls was estimated. For this purpose, a variable with nine categories based on all possible combinations of birth order (first-born, second-born, or third-born) and gender composition of all individual's siblings (all male, all female, mixed gender), including those siblings that are outside of the analytical sample, was generated.

Within-family analysis with respect to all the outcomes produced no significant results. Between-family estimates² (Fig. 3) showed that being raised among older female siblings gave an advantage of a higher probability of upper secondary school enrolment for third-born girls and third-born boys (although of a limited magnitude). This suggests that, to some extent, girls might provide a positive example for their younger siblings. In addition, third-born girls having only sisters and third-born boys having only brothers were, to some extent, more likely to be enrolled in science programs of the academic track compared to the other categories for the same gender (Fig. 4). This result might point to a social learning theory claiming that a child is more likely to follow the example of his/her siblings if they are of the same gender.

² See the full table (Tab. A9) in the Appendix to Chapter 2

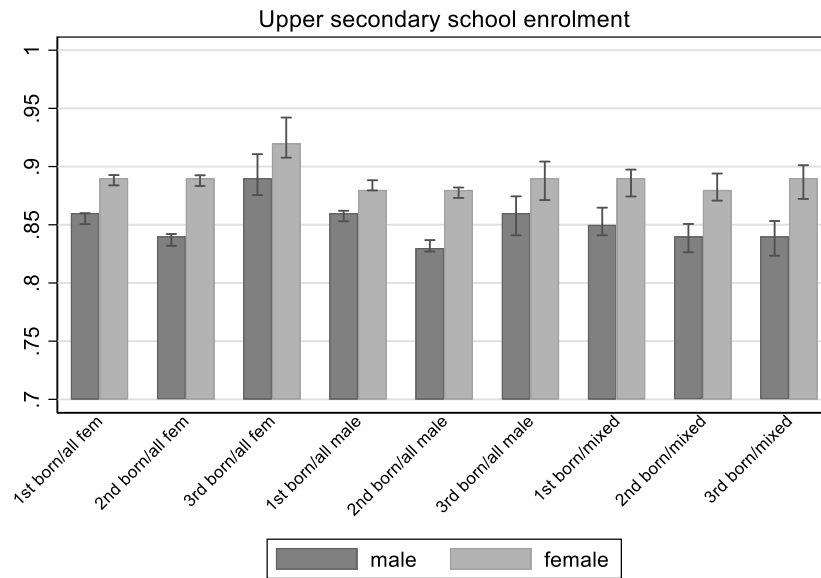


Figure 3 - Between-family estimates of the interacted impact of an individual's birth order and his/her siblings' gender composition on upper secondary school enrolment.

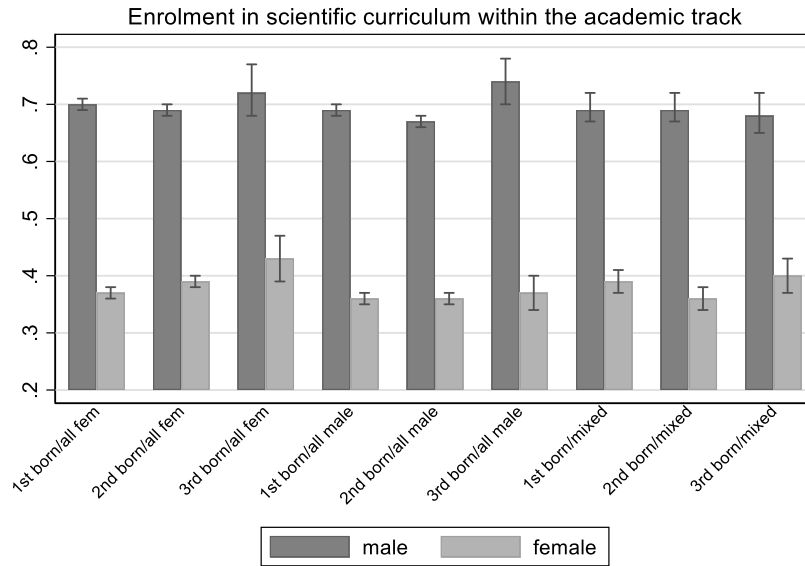


Figure 4 - Between-family estimates of the interacted impact of an individual's birth order and his/her siblings' gender composition on enrolment in science programs of the academic track.

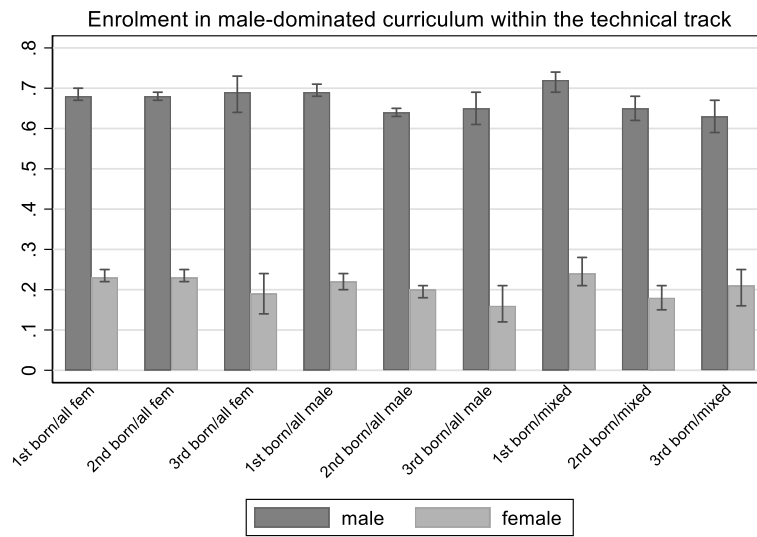


Figure 5 - Between-family estimates of the interacted impact of an individual's birth order and his/her siblings' gender composition on enrolment in industry-oriented programs of the technical track.

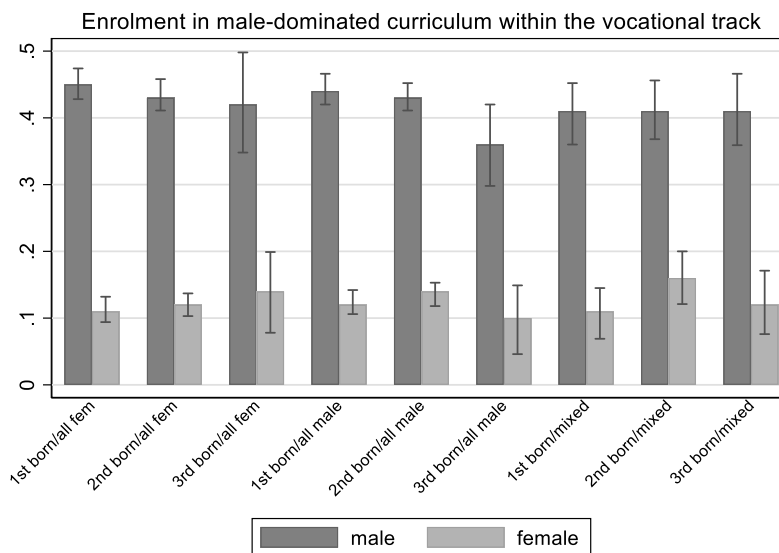


Figure 6 - Between-family estimates of the interacted impact of an individual's birth order and his/her siblings' gender composition on enrolment in industry-oriented programs of the vocational track.

With respect to the technical and vocational tracks, the results did not reveal any substantial and statistically significant differences in the effects of various combinations of sibling gender composition and birth order neither for boys nor for girls (Fig. 5 and Fig. 6). Overall, the limited magnitude of the interacted impact of the birth order and siblings' gender composition suggests that the choice of the curriculum is probably a result of individual preferences or parental decisions rather than the influence of siblings.

An additional between-family analysis on a sample of families with only two children did not show any critical discrepancies with the above-mentioned results. Future studies might further explore the issue of within-family differences in the impact of birth order and siblings' gender composition using, for instance, administrative data with a large set of observations and detailed information on educational outcomes, including cognitive ability.

10. Conclusions

Educational inequalities are one of the most persistent social problems of modern societies that have received extensive attention in social science research. Despite the dramatic educational expansion during the 20th century, inequality IEOs have not disappeared completely, and family background still represents an important predicting factor for individual attainments (Bukodi and Goldthorpe, 2013; Marzadro and Schizzerotto, 2014). The persistence of IEO induced greater attention of scholars to the qualitative dimension of education, such as the placement of students into different curricula or tracks in secondary education. It was shown that children of advantaged backgrounds are more likely to enrol in academic tracks, while children of lower social origins are more likely to follow vocational tracks (Breen and Jonsson, 2000; Gamoran and Mare, 1989; Lucas, 1999, 2001). The analysis of the horizontal dimension of educational inequalities is also important due to its link to future gender inequalities in the labour market. Within the academic track, girls are underrepresented in the scientific curriculum and overrepresented in the foreign languages and socio-pedagogic curricula. In technical and vocational tracks, females are less likely than males to attend industry-oriented curricula and are more likely than males to be enrolled in service-oriented curricula (tourism, catering, accounting, etc.). These gendered patterns account for almost two-thirds of gender differences in access to the humanities and social sciences, and almost one-third of the gender gap in engineering and computing at the university level (Barone & Assirelli, 2020). This results in less favourable labour market prospects for women in terms of unemployment rates, earnings, and the risks of overeducation and skill mismatch, which are the outcomes found to be associated with humanities and the social sciences (Assirelli 2015; Barone & Ortiz 2011; Davies & Guppy 1997; Reimer et al. 2011).

The most popular way of studying educational inequalities is the intergenerational mobility approach implying the analysis of differences in educational outcomes between individuals coming from different families. An alternative approach is *sibling correlation* defined as the fraction of total inequality (measured as the variance) attributed to the factors shared by the children belonging to the same family. The key advantage of this method, compared to the intergenerational mobility approach, is that it provides a comprehensive measure of the importance of family background and community effects (Björklund & Jäntti, 2020), including the unobserved factors. The studies using the sibling correlation approach show that around half of the variation in educational outcomes is explained by the family background, which implies that another half of the variation arises *within the families*, due to the individual differences between siblings (Grätz, 2018). Therefore, the research on educational inequalities should not only focus on between-family analysis but also be supplemented by *within-family analysis* using *family fixed-effects models*. This method allows measuring the impact of child-specific factors (gender, birth order, maternal age, etc.) on within-family differences in educational outcomes, controlling for unobserved confounding variables, which are constant between siblings at the family level and in the environment.

This study provided between- and within-family analysis of educational inequalities in upper secondary education in Italy, which allowed estimating the fraction of variation in educational outcomes attributed to the family background and the gender differences in the outcomes holding constant all the common family-related factors (both observed and unobserved). The main results can be summarised in five points. First, the sibling correlations on educational outcomes related to upper secondary school in Italy were found to be in line with the results of the previous studies that analysed sibling similarity in years of education in other countries. Almost half (49%) of the variation in the probability of attending upper secondary school was attributed to the family background.

Second, the study demonstrated that the comparison of sibling correlations on binary outcomes might be misleading and problematic and should be complemented by the analysis of additional statistics (Breen & Ermisch, 2021). For instance, a simple comparison of ICCs on upper secondary school enrolment by parental education showed that there is less sibling similarity within families where parents are tertiary educated than within families where parents have less education, which might have seemed to provide

support for the theories of parental reinforcement. However, this result was driven by the fact that in the case of advantaged families, there was very little variation both at the individual level and at the family level since almost all sibling groups had the same outcome of being enrolled in upper secondary school. Sibling correlation on the attendance of science-oriented curriculum within the academic track was found to be lower than for the other two tracks due to the greater importance of individual characteristics as opposed to the family background. At the same time, the proportion of sibling groups with the same outcome of being enrolled in male-dominated programs for this track was higher than for the other two tracks, especially the vocational track, where there was more similarity in the negative outcome.

Third, as expected, family fixed-effects models showed that within better-off families gender differences in attending upper secondary school are non-existent, while they are particularly strong when parents have low levels of education, which confirmed the greater vulnerability of boys compared to girls to the social-origin disadvantage. At the same time, girls were found to be less likely than boys to attend the programs which in the future lead to better labour market prospects, and this disadvantage was particularly large within the technical track. This result indicates that gender inequalities in the choice of more prospective majors exist even if girls and boys are brought up within the same family, suggesting that the differences might arise due to the diverse treatment of parents, teachers, and significant others toward boys and girls, or due to the expressive motivations of male and females related to preferences for certain school subjects and specific occupations (Barone & Assirelli, 2020). Future research might attempt to estimate these factors, their importance, and implications for further educational outcomes. Unfortunately, the data used in this study did not offer information on these aspects of family background and individual preferences.

Fourth, between-family estimates confirmed the expectations of smaller gender discrepancies (although of a very limited magnitude) in the choice of science/industry-oriented curricula within all the tracks among advantaged families compared to other socioeconomic groups. At the same time, the within-family estimates for the technical and vocational tracks showed that the female disadvantage in being enrolled in industry-oriented curricula was relatively lower in families with lower-educated parents than within families with highly-educated parents. This might be related to the fact that

industry-oriented curricula within the technical and vocational tracks include not only programs linked to blue-collar occupations but also programs for preparing surveyors (*geometra*), business experts (*periti d'azienda*), informatics specialists (*informatica*) (technical track), as well as programmers (*programmatori*) (vocational track) which might be considered as somewhat promising options for the boys from better-off families.

Finally, the study found no substantial and statistically significant impact of birth order interacted with gender on educational outcomes and no significant heterogeneity of this effect by parental education. With respect to the impact of birth order interacted with gender and siblings' gender composition, between-family models showed that being raised among older female siblings gave an advantage of a higher probability of upper secondary school enrolment for third-born girls and third-born boys (although of a limited magnitude). In addition, third-born girls having only sisters and third-born boys having only brothers were, to some extent, more likely to be enrolled in science programs of the academic track compared to the other categories for the same gender. With respect to the technical and vocational tracks, the results did not reveal any substantial and statistically significant differences in the effects of various combinations of sibling gender composition and birth order neither for boys nor for girls. Overall, the limited magnitude of the combined impact of the birth order and siblings' gender composition suggests that the choice of the curriculum is probably a result of individual preferences or parental decisions rather than the influence of siblings.

Overall, this study shed light on how interrelated mechanisms involving family background, individual characteristics, and contextual factors shape intergenerational educational outcomes in track choices among Italian students. The findings demonstrate that the weight of family background, as well as within-family gender differences, vary depending on the track considered and that there is heterogeneity within the traditional academic, technical, and vocational tracks. Thus, the study highlights the importance of considering other dimensions of horizontal stratification in future research, such as the distinction among schools with different teaching programmes, e. g., science- and industry-oriented schools. While previous research has primarily focused on the hierarchy among academic, technical, and vocational tracks (e.g., Panichella & Triventi, 2014), the expansion of upper secondary education in Western Europe – where participation at this level has become nearly universal – emphasizes the importance of new and unexplored

dimensions of horizontal stratification. Moreover, the focus on such dimensions is relevant due to their implications for gender labour market outcomes.

The main limitation of this study is that it did not account for the cognitive skills due to the absence of relative information in the dataset. Future studies might further explore the issue of within-family gender differences in educational outcomes, using, for instance, administrative data with a large set of observations and detailed information on educational outcomes, including cognitive ability.

Appendix

Table A1 – Upper secondary school enrolment. Results from family fixed effects models.

VARIABLES	Total sample	By parental education		
		Lower secondary or less	Upper secondary	Tertiary
Gender (ref. Male)				
Female	0.04*** (0.03 - 0.05)	0.05*** (0.03 - 0.07)	0.04*** (0.03 - 0.05)	0.01 (-0.01 - 0.02)
Birth order (ref. First-born)				
Second-born	-0.02*** (-0.02 - -0.01)	-0.02** (-0.03 - -0.00)	-0.02*** (-0.03 - -0.01)	-0.01** (-0.02 - -0.00)
Third-born or higher order	-0.02** (-0.03 - -0.00)	-0.02 (-0.05 - 0.01)	-0.02 (-0.04 - 0.01)	0.00 (-0.03 - 0.04)
Constant	0.85*** (0.84 - 0.85)	0.73*** (0.72 - 0.75)	0.89*** (0.88 - 0.90)	0.96*** (0.95 - 0.97)
Observations	23,022	8,398	10,637	3,987
Number of households	11,443	4,182	5,279	1,982

Robust confidence intervals in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table A2 – Enrolment in science-oriented curriculum within the academic track. Results from family fixed effects models.

VARIABLES	Total sample	By parental education		
		Lower secondary or less	Upper secondary	Tertiary
Gender (ref. Male)				
Female	-0.29*** (-0.32 - -0.26)	-0.38*** (-0.48 - -0.29)	-0.25*** (-0.29 - -0.20)	-0.32*** (-0.37 - -0.28)
Birth order (ref. First-born)				
Second-born	0.01 (-0.01 - 0.03)	-0.02 (-0.07 - 0.03)	-0.00 (-0.03 - 0.03)	0.03* (-0.00 - 0.06)
Third-born or higher order	-0.02 (-0.08 - 0.03)	-0.09 (-0.21 - 0.04)	-0.06 (-0.14 - 0.01)	0.05 (-0.04 - 0.13)
Constant	0.66*** (0.64 - 0.68)	0.66*** (0.58 - 0.74)	0.65*** (0.62 - 0.68)	0.70*** (0.68 - 0.73)
Observations	10,128	1,862	5,060	3,206
Number of households	6,522	1,378	3,371	1,773

Robust confidence intervals in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table A3 – Enrolment in industry-oriented curriculum within the technical track. Results from family fixed effects models.

VARIABLES	Total sample	By parental education		
		Lower secondary or less	Upper secondary	Tertiary
Gender (ref. Male)				
Female	-0.43*** (-0.48 - -0.38)	-0.34*** (-0.41 - -0.28)	-0.52*** (-0.61 - -0.44)	-0.41*** (-0.61 - -0.21)
Birth order (ref. First-born)				
Second-born	-0.02 (-0.05 - 0.02)	-0.01 (-0.05 - 0.03)	-0.01 (-0.06 - 0.04)	-0.10* (-0.22 - 0.01)
Third-born or higher order	0.02 (-0.04 - 0.08)	0.07* (-0.01 - 0.16)	0.01 (-0.09 - 0.11)	-0.10 (-0.30 - 0.09)
Constant	0.67*** (0.64 - 0.69)	0.62*** (0.58 - 0.66)	0.69*** (0.66 - 0.73)	0.75*** (0.66 - 0.85)
Observations	4,691	2,066	2,310	315
Number of households	3,574	1,527	1,795	252

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A4 – Enrolment in industry-oriented curriculum within the vocational track. Results from family fixed effects models.

VARIABLES	Total sample	By parental education		
		Lower secondary or less	Upper secondary	Tertiary
Gender (ref. Male)				
Female	-0.28*** (-0.38 - -0.19)	-0.33*** (-0.45 - -0.21)	-0.20** (-0.35 - -0.04)	-0.63*** (-1.05 - -0.21)
Birth order (ref. First-born)				
Second-born	0.00 (-0.05 - 0.05)	-0.00 (-0.07 - 0.07)	-0.02 (-0.09 - 0.04)	0.01 (-0.29 - 0.31)
Third-born or higher order	0.12** (0.02 - 0.23)	0.04 (-0.05 - 0.13)	0.36** (0.08 - 0.64)	0.20 (-0.29 - 0.68)
Constant	0.41*** (0.36 - 0.47)	0.44*** (0.37 - 0.51)	0.37*** (0.28 - 0.46)	0.49*** (0.27 - 0.71)
Observations	2,089	1,170	831	88
Number of households	1,703	929	698	76

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A5 – Upper secondary school enrolment. Results from between-family models.

VARIABLES	Total sample	By parental education		
		Lower secondary or less	Upper secondary	Tertiary
Gender (ref. Male)				
Female	0.04*** (0.04 - 0.04)	0.06*** (0.06 - 0.07)	0.03*** (0.03 - 0.03)	0.01*** (0.01 - 0.01)
Birth order (ref. Single child)				
First-born	0.05*** (0.04 - 0.06)	0.08*** (0.07 - 0.09)	0.03*** (0.03 - 0.04)	0.01 (-0.00 - 0.01)
Second-born	0.04*** (0.03 - 0.04)	0.06*** (0.05 - 0.07)	0.02*** (0.01 - 0.03)	0.00 (-0.01 - 0.01)
Third-born	0.06*** (0.04 - 0.07)	0.10*** (0.08 - 0.12)	0.03*** (0.01 - 0.04)	0.01 (-0.01 - 0.02)
Number of children in a family	-0.04*** (-0.05 - -0.04)	-0.07*** (-0.08 - -0.06)	-0.02*** (-0.03 - -0.02)	-0.00 (-0.01 - 0.00)
Parental education (ref. Lower secondary or less)				
Upper secondary	0.15*** (0.14 - 0.15)	-	-	-
Tertiary	0.20*** (0.19 - 0.20)	-	-	-
Constant	0.77*** (0.76 - 0.78)	0.79*** (0.77 - 0.80)	0.91*** (0.90 - 0.92)	0.95*** (0.94 - 0.97)
Observations	231,960	83,290	114,234	34,436

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for the region of residence

Table A6 – Enrolment in science-oriented curriculum within the academic track. Results from between-family models.

VARIABLES	Total sample	By parental education		
		Lower secondary or less	Upper secondary	Tertiary
Gender (ref. Male)				
Female	-0.31*** (-0.32 - -0.31)	-0.32*** (-0.34 - -0.31)	-0.33*** (-0.34 - -0.32)	-0.27*** (-0.28 - -0.26)
Birth order (ref. Single child)				
First-born	0.06*** (0.05 - 0.07)	0.04*** (0.01 - 0.07)	0.07*** (0.05 - 0.09)	0.06*** (0.03 - 0.08)
Second-born	0.06*** (0.04 - 0.07)	0.02 (-0.01 - 0.05)	0.06*** (0.04 - 0.08)	0.08*** (0.05 - 0.11)
Third-born	0.08*** (0.06 - 0.10)	0.04 (-0.01 - 0.08)	0.09*** (0.06 - 0.13)	0.09*** (0.05 - 0.14)
Number of children in a family	-0.03*** (-0.04 - -0.03)	-0.03*** (-0.04 - -0.01)	-0.04*** (-0.06 - -0.03)	-0.03*** (-0.04 - -0.01)
Parental education (ref. Lower secondary or less)				
Upper secondary	0.09*** (0.08 - 0.10)	-	-	-
Tertiary	0.12*** (0.11 - 0.13)	-	-	-
Constant	0.64*** (0.62 - 0.65)	0.65*** (0.61 - 0.68)	0.76*** (0.74 - 0.78)	0.70*** (0.67 - 0.73)
Observations	103,400	20,614	55,426	27,360

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for the region of residence

Table A7 – Enrolment in industry-oriented curriculum within the technical track. Results from between-family models.

VARIABLES	Total sample	By parental education		
		Lower secondary or less	Upper secondary	Tertiary
Gender (ref. Male)				
Female	-0.45*** (-0.46 - -0.45)	-0.46*** (-0.47 - -0.45)	-0.45*** (-0.46 - -0.44)	-0.38*** (-0.41 - -0.34)
Birth order (ref. Single child)				
First-born	0.02* (-0.00 - 0.03)	0.02 (-0.01 - 0.04)	0.00 (-0.02 - 0.03)	0.11*** (0.03 - 0.18)
Second-born	-0.01 (-0.03 - 0.01)	0.01 (-0.02 - 0.04)	-0.04*** (-0.06 - -0.01)	0.07* (-0.00 - 0.15)
Third-born	-0.03 (-0.06 - 0.01)	-0.02 (-0.06 - 0.03)	-0.04* (-0.09 - 0.00)	0.11* (-0.02 - 0.24)
Number of children in a family	0.00 (-0.01 - 0.02)	-0.01 (-0.02 - 0.01)	0.02* (-0.00 - 0.03)	-0.04 (-0.09 - 0.01)
Parental education (ref. Lower secondary or less)				
Upper secondary	-0.03*** (-0.04 - -0.02)	-	-	-
Tertiary	-0.04*** (-0.06 - -0.02)	-	-	-
Constant	0.77*** (0.75 - 0.80)	0.78*** (0.75 - 0.82)	0.73*** (0.71 - 0.76)	0.81*** (0.72 - 0.89)
Observations	49,831	20,522	26,289	3,020

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for the region of residence

Table A8 – Enrolment in industry-oriented curriculum within the vocational track. Results from between-family models.

VARIABLES	Total sample	By parental education		
		Lower secondary or less	Upper secondary	Tertiary
Gender (ref. Male)				
Female	-0.32*** (-0.33 - -0.31)	-0.33*** (-0.34 - -0.31)	-0.31*** (-0.33 - -0.29)	-0.30*** (-0.37 - -0.24)
Birth order (ref. Single child)				
First-born	-0.00 (-0.03 - 0.02)	-0.01 (-0.05 - 0.02)	-0.01 (-0.05 - 0.03)	0.10 (-0.06 - 0.26)
Second-born	-0.00 (-0.03 - 0.02)	-0.01 (-0.04 - 0.03)	-0.02 (-0.06 - 0.02)	0.13* (-0.02 - 0.28)
Third-born	-0.02 (-0.07 - 0.02)	-0.01 (-0.07 - 0.04)	-0.08** (-0.16 - -0.01)	0.14 (-0.11 - 0.38)
Number of children in a family	0.00 (-0.01 - 0.02)	0.00 (-0.02 - 0.02)	0.02 (-0.01 - 0.05)	-0.08 (-0.18 - 0.02)
Parental education (ref. Lower secondary or less)				
Upper secondary	-0.03*** (-0.04 - -0.02)	-	-	-
Tertiary	-0.07*** (-0.11 - -0.04)	-	-	-
Constant	0.44*** (0.41 - 0.47)	0.45*** (0.41 - 0.50)	0.39*** (0.34 - 0.44)	0.29*** (0.13 - 0.45)
Observations	20,217	11,343	8,242	632

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for the region of residence

Table A9 – Between-family models: the interacted impact of an individual’s birth order and his/her siblings’ gender composition on educational outcomes.

VARIABLES	Upper secondary school enrolment	Science curriculum - academic track	Industry-oriented curriculum - technical track	Industry-oriented curriculum - vocational track
Gender (ref. Male)				
Female	0.03*** (0.03 - 0.04)	-0.33*** (-0.34 - -0.32)	-0.45*** (-0.47 - -0.43)	-0.34*** (-0.37 - -0.31)
Birth order and sibling group gender composition (ref. First-born, all female)				
Second-born, all female	-0.02*** (-0.03 - -0.01)	-0.01 (-0.03 - 0.00)	-0.01 (-0.02 - 0.01)	-0.02 (-0.05 - 0.02)
Third-born, all female	0.04*** (0.02 - 0.06)	0.02 (-0.02 - 0.07)	0.00 (-0.05 - 0.05)	-0.03 (-0.11 - 0.05)
First-born, all male	0.00 (-0.00 - 0.01)	-0.01 (-0.03 - 0.00)	0.01 (-0.01 - 0.03)	-0.01 (-0.04 - 0.02)
Second-born, all male	-0.02*** (-0.03 - -0.02)	-0.03*** (-0.04 - -0.01)	-0.04*** (-0.06 - -0.03)	-0.02 (-0.05 - 0.01)
Third-born, all male	0.00 (-0.02 - 0.02)	0.04* (-0.01 - 0.08)	-0.04 (-0.08 - 0.01)	-0.09*** (-0.16 - -0.03)
First-born, mixed	-0.00 (-0.02 - 0.01)	-0.01 (-0.04 - 0.02)	0.03* (-0.00 - 0.06)	-0.04* (-0.10 - 0.01)
Second-born, mixed	-0.02** (-0.03 - -0.00)	-0.01 (-0.04 - 0.03)	-0.03* (-0.07 - 0.00)	-0.04 (-0.09 - 0.01)
Third-born, mixed	-0.02** (-0.03 - -0.00)	-0.02 (-0.06 - 0.02)	-0.05*** (-0.09 - -0.01)	-0.04 (-0.10 - 0.02)
Gender#Birth order and sibling group gender composition				
Female#Second-born, all female	0.02*** (0.01 - 0.03)	0.03*** (0.01 - 0.05)	0.01 (-0.02 - 0.04)	0.02 (-0.02 - 0.06)
Female#Third-born, all female	-0.00 (-0.03 - 0.02)	0.04 (-0.02 - 0.09)	-0.05 (-0.11 - 0.02)	0.05 (-0.04 - 0.15)
Female#First-born, all male	-0.01 (-0.02 - 0.00)	0.00 (-0.02 - 0.02)	-0.02 (-0.05 - 0.01)	0.02 (-0.02 - 0.06)
Female#Second-born, all male	0.01*** (0.00 - 0.02)	0.02* (-0.00 - 0.04)	0.01 (-0.02 - 0.03)	0.04** (0.00 - 0.08)
Female#Third-born, all male	-0.00 (-0.03 - 0.02)	-0.03 (-0.09 - 0.02)	-0.03 (-0.09 - 0.03)	0.08* (-0.01 - 0.16)
Female#First-born, mixed	0.00 (-0.02 - 0.02)	0.03 (-0.01 - 0.06)	-0.02 (-0.07 - 0.03)	0.04 (-0.02 - 0.10)

VARIABLES	Upper secondary school enrolment	Science curriculum - academic track	Industry-oriented curriculum - technical track	Industry-oriented curriculum - vocational track
Female#Second-born, mixed	0.01 (-0.01 - 0.03)	-0.01 (-0.04 - 0.03)	-0.02 (-0.07 - 0.02)	0.09*** (0.02 - 0.15)
Female#Third-born, mixed	0.02 (-0.01 - 0.04)	0.05** (0.00 - 0.09)	0.03 (-0.03 - 0.08)	0.05 (-0.02 - 0.12)
Parental education (ref. Lower secondary or less)				
Upper secondary	0.15*** (0.15 - 0.16)	0.09*** (0.08 - 0.10)	-0.03*** (-0.04 - -0.02)	-0.02*** (-0.04 - -0.01)
Tertiary	0.20*** (0.20 - 0.20)	0.13*** (0.12 - 0.14)	-0.03*** (-0.05 - -0.01)	-0.06*** (-0.10 - -0.02)
Number of children in a family	-0.04*** (-0.05 - -0.04)	-0.04*** (-0.05 - -0.02)	0.00 (-0.01 - 0.02)	0.01 (-0.01 - 0.03)
Constant	0.82*** (0.80 - 0.83)	0.71*** (0.68 - 0.74)	0.78*** (0.74 - 0.82)	0.44*** (0.38 - 0.50)
Observations	183,434	80,581	40,006	16,506

Robust confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for the region of residence

Figure A1 - Probabilities of upper secondary school enrolment and their heterogeneity by parental education: average predictions obtained from family fixed-effects models with interaction terms between gender and birth order.

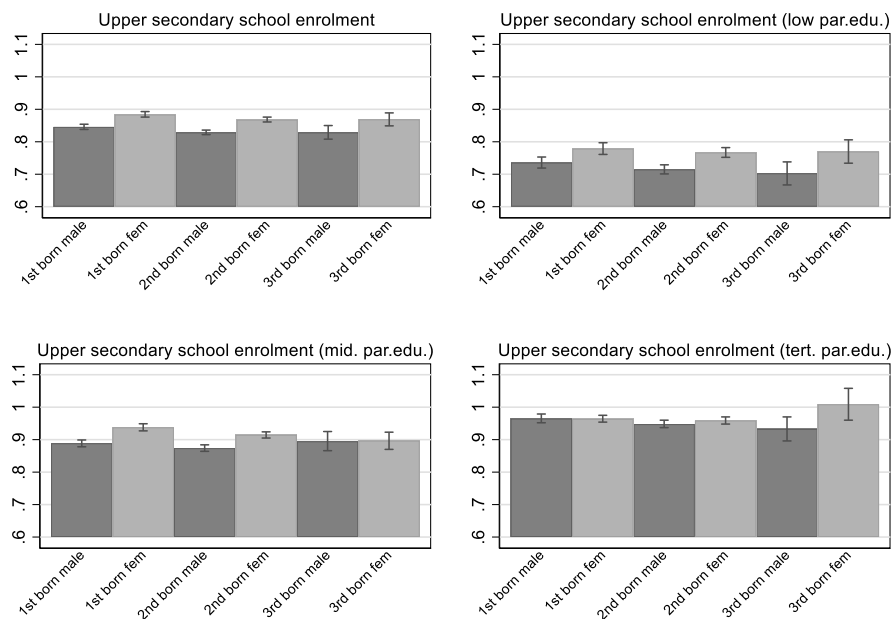


Figure A2 - Probabilities of enrolment in the science-oriented (male-dominated) curriculum of the academic track and their heterogeneity by parental education: average predictions obtained from family fixed-effects models with interaction terms between gender and birth order.

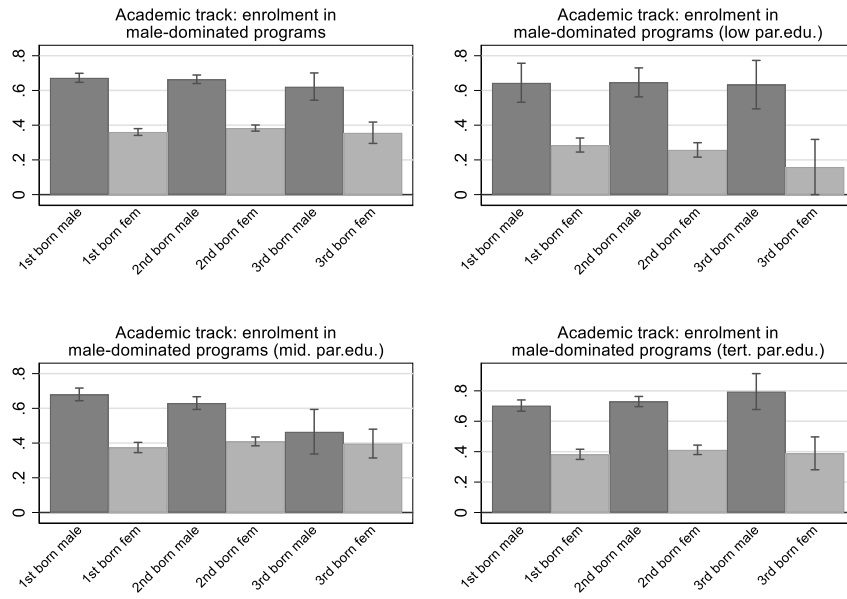


Figure A3 - Probabilities of enrolment in the industry-oriented (male-dominated) curriculum of the technical track and their heterogeneity by parental education: average predictions obtained from family fixed-effects models with interaction terms between gender and birth order.

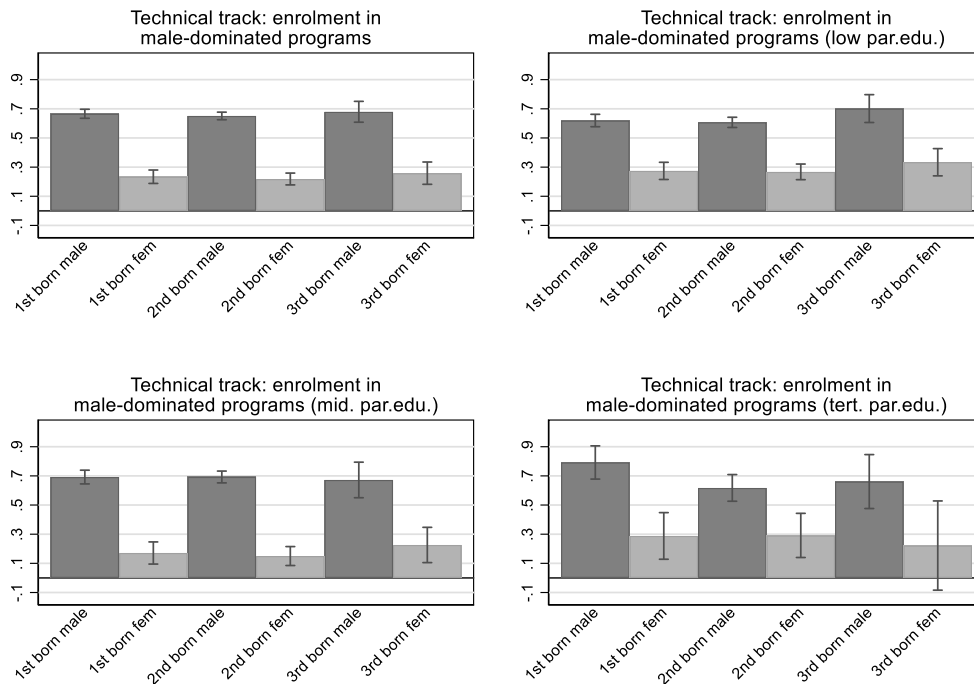
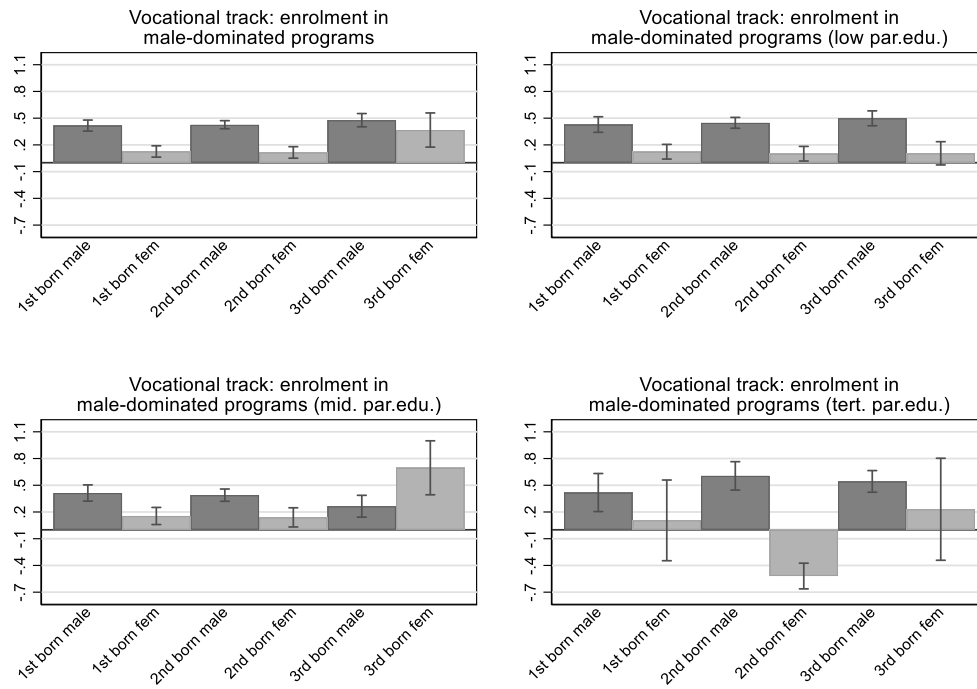


Figure A4 - Probabilities of enrolment in the industry-oriented (male-dominated) curriculum of the vocational track and their heterogeneity by parental education: average predictions obtained from family fixed-effects models with interaction terms between gender and birth order.



Chapter 3

Family Migration and Women's Employment Over the Life Course. An Empirical Analysis of the Tied Migration Argument in Interregional Internal Migration in Europe.

As it has been shown in the introductory chapter of this thesis, women are disadvantaged compared to men in terms of employment probability and earnings, and one of the key factors creating such inequality is embedded within a family context and related to the transition to parenthood. While considerable attention has been paid to the role of motherhood, less is known about another aspect of family dynamics, that is, migration (Cooke et al., 2009). Although single women, like single men, were found to benefit from geographical mobility (GM) by taking advantage of better job opportunities offered in locations different from their place of origin or current residence (e.g., Geist & McManus, 2012; Jacobsen & Levin, 1997; Maxwell, 1988), partnered or family migration was shown to result in unfavourable labour market outcomes for females while improving the earnings of men (Cooke, 2003; Jacobsen & Levin, 2000).

The diverging outcomes of family migration for men and women were linked by the literature to the tied migration theory (Mincer, 1978) deriving from the human capital model of migration. According to this theory, couples move when the benefits to the family from doing so outweigh the costs so that the family utility is maximized. This means that a family may decide to migrate even if this action does not maximize the individual utility of each family member. As a result, partners who initiate migration for their own advantage have been labelled "*lead migrants*", whereas those who are constrained to move facing prospective disadvantageous opportunities have been called "*tied migrants*". While the theory assumes that the potential gains and losses of each individual are given equal weight, the empirical evidence has shown that women more often find themselves in a position of "*tied migrant*" or "*trailing wife*", relocating in response to their partners' movement and facing negative consequences in terms of employment and earnings (e.g., Shihadeh, 1991; Bielby & Bielby, 1992; Cooke, 2003; Shauman & Noonan, 2007).

Despite extensive empirical evidence on “*tied migration*”, previous research has some important limitations. On the one hand, the studies on international mobility of couples have mainly focused on comparing migrated men and women with the native population in terms of occupational outcomes and highlighting the “double disadvantage” of migrant females as a result of the combined negative impact of birthplace and gender (Boyd, 1984; Donato et al., 2014). However, this research stream does not inform about the differences in outcomes between those women who migrated and those who remained in the place of origin due to the absence of data related to the periods preceding migration. On the other hand, studies on internal migration, referring to long-distance moves within national borders, have investigated tied migration considering exclusively marital relationships as the unit of analysis, thus comparing the labour outcomes of married women who migrated with their husbands to married women who did not relocate. This research has been mainly framed by employment- and career-related arguments (Erlinghagen, 2021), neglecting the fact that couple migration might be a part of the family formation process. It has been shown that marriage and migration are often two closely connected and synchronized events meaning that marriage might occur shortly before or after relocation (Mulder & Wagner, 1993). For this reason, considering only married couples and ignoring cohabiting ones might lead to an incomplete analysis of the tied migration phenomenon. Thus, this study considers couple migration not only in the period of marriage but also in the preceding period of engagement. Furthermore, the studies on tied migration have not accounted for the fact that partners often move sequentially and several years apart (Green et al., 1999; OECD, 2017). For instance, a male partner might relocate first to explore the new environment and build the economic ground for the following migration of his female partner. While much attention has been paid to the impact of tied migration event on the labour market outcomes of women, no studies so far have analysed what happens to employment and occupational situation of women in the place of origin during the period of family separation. Finally, only a few studies have analysed the mid-long run consequences of couple migration for women, providing mixed evidence with some results showing that the negative outcomes are short-lived (Clark & Withers, 2002) and others finding persistent disadvantage several years after the move (Cooke et al., 2009).

The use of a large comparative panel data (SHARELIFE) in this study allows the author to overcome the limitations of the previous research owing to the availability of retrospective information on one's residential changes, employment, and family dynamics. The study aims, first, to analyse the impact of different internal migration patterns interacted with civil status on female employment opportunities, taking into account family migration dynamics before marriage and analysing the heterogeneity of these patterns by educational level. Second, the study aims to examine the change in female employment probabilities over age, comparing various migration simulated scenarios, to test whether they might foster cumulative (dis)advantages over the life course (DiPrete & Eirich, 2006).

The study brings several contributions to the previous research. First, it employs a novel continuous measure of family migration which allows to analyse employment outcomes in the period of family separation and consider engagement. In contrast to previous research, the study distinguishes not only between tied migrants and stayers, or tied migrants and single movers but also takes into account various combinations of marital and migration statuses, including, for example, women who relocated but their partners remained in the place of origin or vice versa, females who moved at the same time with their partners. Second, this detailed measure of migration patterns allows to examine the interrelation between marriage/cohabitation and geographical mobility contributing thus to the life course research. Finally, it examines the impact of migration patterns on female employment in the mid-long run. This analysis allows to investigate whether the initial employment penalty of partnered women is enhanced over time due to family migration, resulting in cumulative disadvantage (Diprete & Eirich, 2006).

The study is structured as follows. The first section examines various explanations of female disadvantages related to family migration starting from microeconomic models of utility maximization and bargaining between partners, as well as sociological theories of gender role ideology, and moving to the structural approach emphasising the role of occupational sex segregation and regional contexts of opportunity in shaping the couple's migration behaviour. The second section is focused on the interdependence of migration and life course events, in particular marriage, and the effects of family migration on women's labour market outcomes in the long run. The third section outlines empirical

strategy, data, and methods. The fourth section describes the results. The final section provides the main conclusions and limitations.

1. Explanations of female labour market disadvantage related to family migration

1.1 From individual to family migration

In order to evaluate the impact of migration on labour market outcomes of women, it is important to understand the mechanisms underlying the migration decision-making process and how these mechanisms are embedded in the context of family. According to the basic individual-level migration model developed by Sjaastad (1962), potential migrants evaluate the discounted costs and benefits of relocating to another region. The costs of moving can be divided into monetary and non-monetary costs. The former includes out-of-pocket expenses of moving, while the latter includes the opportunity costs (the foregone income in the period of travelling, searching, and training for a new job) and the so-called “psychic costs” related to leaving behind family, friends, and familiar environment. The returns to migration can also be split up into monetary and non-monetary components. The monetary returns imply not only an increase or decrease in one’s income but a change in one’s capacity as a consumer. The non-monetary component reflects the individual’s preferences for the new place compared to the former residence. If the gains exceed the costs (if the net benefit is larger than zero), the individual decides to migrate to the other region. Hence, the model of individual migration can be formalized as follows:

$$R_i = G_i - C_i > 0 \quad (4),$$

where R_i is the expected return, G_i is the expected gains, and C_i is the expected costs of migration.

The evidence shows that, in almost all national contexts, the probability of migrating is the highest in early adulthood, among those aged 18-25 (Fielding, 2012). Migration decisions in this period of life are mainly guided by occupational and educational motives marking the stages of transition into independent adulthood, such as leaving the parental home, enrolling in education, and entering the labour market. Moreover, many studies have found that migrants are positively selected on educational qualifications (Polavieja et al, 2018). Education increases employment opportunities and returns to wages and

allows to alleviate the risks and costs of relocating. This is explained by the fact that highly educated individuals are more likely to be informed about employment opportunities and living conditions in other places, rely on wider social networks (Palloni et al. 2001), use more refined ways of estimating net migration gains (Greenwood, 1975, 2014; Greenwood & Hunt, 2003), and integrate economically more easily at destinations (Lall & Selod, 2006).

The formation of partnerships and families, however, leads to more complex decision-making processes implying the evaluations that go far beyond maximising individual economic returns (Coulter & Scott, 2015), since partners, unlike single individuals, must coordinate their location preferences, as well as employment and earnings capacities of each other. The literature on family migration consistently shows that women experience negative labour market outcomes in terms of employment chances and earnings (e.g., Shauman & Noonan, 2007; Boyle et al., 2009; Clark & Huang, 2006; Geist & McManus, 2012; Jacobsen & Levin, 1997), while the earnings of partnered men tend to increase after the move (Cooke, 2003; Jacobsen & Levin, 2000). This gender asymmetry in migration patterns has much challenged theoretical explanations. The earliest research on family migration conducted by economists in the 1970s and sociologists in the 1980s primarily concentrated on internal determinants and decision-making within couples by relying on either microeconomic models of utility maximization and bargaining between partners or sociological theories of gender role ideology. Further theoretical and empirical efforts have focused on the unresolved and ongoing debate about which of these explanations to endorse. General criticism of these approaches has recently emerged, pointing out the importance of considering the occupational context, namely occupational sex segregation, in shaping the mobility opportunities of men and women (Nisic & Melzer, 2016; Shauman & Noonan, 2007). However, the question of the relevance of structural explanations remains open. In addition, the recent research in family migration has taken a transdisciplinary perspective emphasising the broader social and economic implications of family migration processes and considering the complex interactions between family dynamics, life course events, and migration decisions. The following sections examine the mechanisms and related theories explaining gender divergence in the outcomes of family migration.

1.2 Household utility maximization and relationship dynamics

The earliest systematic research on family migration was conducted by economists in the 1970s. Among these first theoretical insights, the most influential remains the tied migration model developed by Mincer (1978) and based on human capital theory. In contrast to the model of individual migration proposed by Sjaastad (1962), tied migration theory no longer considers private rational interests the driver of the migration decision and argues instead that this decision is taken in the family context and particularly between partners in an effort to promote their collective return. According to this model, a family decides to migrate when the expected benefits to the couple from doing so outweigh the expected costs, and family utility is thereby maximized. The family utility is conceptualized as the net balance of the partner-specific costs and benefits associated with a migration. Mathematically, the model of tied migration can be expressed as follows:

$$R_c = \sum_{i=P1,P2} G_i - C_i > 0 \quad (5),$$

where R_c is the couple's expected return from migration (or family utility) and P1 stands for Partner 1 and P2 for Partner 2.

The model assumes that the family utility can be positive not only when benefits outweigh the costs for both partners, but also when only one partner is expected to gain from migration. For instance, $R_{P1} < 0$ and $R_{P2} > 0$ – that is, Partner 1 expects to lose from migration, whereas Partner 2 expects to benefit from it. Yet, if $R_{P2} > |R_{P1}|$ and the expected net returns of Partner 2, therefore, are higher than the expected losses of Partner 1 in absolute terms, the couple's utility from migration is still positive, which means that it is rational for the family to move. In this scenario, a partner who migrates for his/her own advantage (i.e., Partner 2) has been labelled a “*lead migrant*”, whereas a partner who moves along facing prospective disadvantageous outcomes (i.e., Partner 1) has been called a “*tied migrant*”. Whether there is and who is the tied migrant is thus independent of gender and is only related to the actual and potential contribution of each partner to family utility.

Despite an a priori gender-neutral character of the model, the economists recognized that the structure of labour markets in industrialized societies, implying occupational sex segregation, and inequality between men and women in labour force participation and

earnings, limited the opportunities for women to increase their income by means of migration. This leads to an expectation (confirmed empirically) that men are more likely to lead family migration, while women are more likely to follow their partners becoming thus “tied migrants” or “trailing wives” (Cooke, 2001). In addition, the model predicts that as partnered women gain more labour market resources (e.g., education, work experience, and earnings) and gender specialization within couples weakens, net family returns from migration decrease, and women’s capacity to influence family migration decisions strengthens. It has been shown that women use their relative resources to block unfavourable family migration (Shauman, 2010). Such a scenario, called “tied staying,” explains why dual-earner couples are less mobile than single-earner couples.

Notwithstanding the empirical support for the basic theory of tied migration, it has been increasingly criticized for its assumption that decisions are made collectively and consensually by partners. Bargaining models have challenged this assumption (Bielby & Bielby, 1992; Lundberg & Pollak, 2003; Ott, 1992). According to these models, migration decisions are the product of a negotiation process in which partners act with respect to their own interests, and compensation of the disadvantaged partner is not taken for granted. The result of such negotiations reflects the will of a family member with relatively more bargaining power. A crucial factor determining the bargaining power is economic success since it promotes an individual’s independence from the partnership and, consequently, allows to dominate the migration decision by increasing the credibility of the threat to leave the partnership otherwise. Therefore, even if the migration might be beneficial for the household as a whole, the potential tied mover can refuse to move conditional on having sufficient bargaining power. The bargaining theory thus implies that the threshold required for a move to occur is higher than in the Mincer model. The migration happens only if both partners a priori benefit individually or if the family net returns from migration are large enough to compensate not only for the direct losses from the relocation but also for the negative shift in the bargaining power of the tied mover.

1.3 The impact of traditional gender role beliefs

Although the model proposed by Mincer and the bargaining approach differ in terms of the assumed migration decision rule, they are coherent with respect to the assumption that the gains and losses of male and female partners are given equal weight in the decision

and that gender cleavage stems only from the differential distribution of migration-relevant characteristics among partners (Cooke, 2008; Rabe, 2011; Shauman, 2010). This gender-symmetric perspective on family migration has been criticised for being unable to explain why men continue to lead family migrations despite women’s progressive accumulation of labour market resources. Empirical evidence has shown that neither the prestige of the female partner's occupation nor the proportionate size of her contribution to the total household income significantly affects family migration decisions (Duncan & Perrucci, 1976; Lichter, 1983; Boyle et al., 2009). In addition, it was found that if women’s education has an influence, it is mostly to impede migration (Bird & Bird, 1985; Melzer, 2013; Shihadeh, 1991; Smits, et al., 2003).

In contrast to the microeconomic gender-neutral approaches, sociologists offered an alternative theoretical explanation based on gender role theory (Bielby & Bielby, 1992; Shihadeh, 1991). Gender roles are “roles that men and women have been socialized to accept in society” (Shihadeh, 1991, p. 433), that structure mutual expectations about behaviour and responsibilities within the family and thereby have a profound impact on the family decision-making process. Traditionally, men are expected to take on the role of breadwinners, while women are supposed to focus on domestic work and care duties, irrespective of their relative earnings. Indeed, the empirical evidence shows that even in families where men’s earnings and labour force attachment are exceeded by those of their wives, the division of household labour continues to be traditional and men are persistently viewed as household heads and breadwinners (Biddlecom & Kramarow, 1998; Potuchek, 1992; Bittman et al, 2003).

Since men’s and women’s roles within the family are viewed as not interchangeable in gender role theory, the costs and benefits of migration should not be calculated in the same way for male and female partners. Thus, traditional gender role beliefs are expected to reproduce in the process of couple migration and to introduce asymmetries into it with females’ returns given a lower weight and males’ returns attributed a higher weight. The adjusted model of family migration is then expressed as follows (Krieger, 2020):

$$R_c = \sum_{i=P1,P2}(G_i - C_i)/\delta_i > 0 \quad (6),$$

where P1 now is the male and P2 is the female partner, $0 < \delta_{P1} < 1$ and $\delta_{P2} > 1$ are discount factors equally accepted by both partners. Consequently, $R_{P1}/\delta_{P1} > R_{P1}$ and $R_{P2}/\delta_{P2} < R_{P2}$. The model suggests that, on the one hand, small expected returns for male

partners are sufficient to guarantee a positive family utility even if female partners expect to sustain high losses. On the other hand, when male partners anticipate a loss, for a family net return to be positive, female partners should expect disproportionately high gains from GM. Therefore, the discount factors reflect the nature of traditional gender roles in which men are assumed to be the main providers (Bielby & Bielby, 1992).

However, it should be noted that testing the gender role approach against the microeconomic household or bargaining models proves to be challenging due to the lack of direct measures of gender role attitudes. Hypotheses are generally tested only indirectly, by showing that gender differences persist even after controlling for productivity-related characteristics or by demonstrating an unequal influence of male and female characteristics on migration decisions (Blackburn, 2010; Cooke, 2003; Shihadeh, 1991; Tenn, 2010). Thus, the empirical evidence regarding the influence of gender ideology on family migration outcomes remains underdeveloped. Early studies that attempted to directly test the impact of individual gender ideology suffered from substantial data limitations (e.g., Bird & Bird, 1985). Other studies implemented static concepts of gender roles without considering the interpersonal variation and temporal dynamics in individual ideologies (e.g., Shihadeh, 1991). Finally, gender ideology has often been measured at the couple level in previous research, ignoring individual-level variation (e.g., Jürges, 2006).

A recent study using data from the British Household Panel Survey and direct measures of each partner's gender ideology has shown that women's gender ideologies did not moderate the association between family migration and subsequent employment (Lersch, 2016). At the same time, women with egalitarian partners were less likely to leave employment after family migration than those with partners having traditional views. The results thus indicated that family migration decisions are more likely to be influenced by men's rather than women's interests. In addition, the fact that even egalitarian women tended to sacrifice their careers in favour of their partners' points to the persistence of gendered structures, for instance, in workplaces that remain affected by the cultural schema of male providers. Finally, it was shown that even after controlling for both partners' gender ideologies and relevant control variables, a substantial female disadvantage in the probability of leaving employment after family migration remained.

1.4 Structural approach: the importance of institutional context

In general, the micro-level explanations outlined above lack empirical support and have been criticised for failing to consider the broader context of opportunities that influence gender inequality in family migration decisions (Halfacree, 1995). For this reason, several studies have begun to question the role of occupational structures and regional contexts of opportunity in shaping the couple's migration behaviour (Shauman, 2010; Branden & Strom, 2011; Perales & Vidal, 2013). It has been argued that gender cleavage in migration outcomes, even at the same level of labour income, may be a consequence of structural gender segregation in occupations that impede women from utilizing their individual human capital and relative resources to influence migration decisions.

Persistent occupational gender segregation implies that men and women continue to be employed in occupations having distinct structural characteristics. Female-dominated jobs are likely to be found in the service sector of the economy, to be more geographically ubiquitous, and to offer fewer opportunities for career growth. Moreover, women tend to be overrepresented in occupations associated with lower average wages, lower occupational prestige, and lesser occupational autonomy and authority than male-dominated occupations (England et al., 1988; Spain & Bianchi, 1996). These structural characteristics are associated with lower benefits from migration for women. As a result, on the one hand, female partners employed in these occupations will be less likely than male partners to initiate family moves since it is unlikely that their net gains from career opportunities in other regions will outweigh their male partners' losses from migration. On the other hand, these characteristics decrease the probability for women to hinder moves since their net loss of earnings is likely to be compensated by the potential income gains linked to remote opportunities for their male partners. Consequently, lower costs of being tied migrants for women may result in a higher risk of (temporary) unemployment following migration, despite the geographical ubiquity of female-dominated occupations that might facilitate a quick re-entry into employment (Perales & Vidal, 2013).

Empirical evidence shows that labour market gender inequalities indeed have an impact on the way men's and women's capabilities affect migration decisions, as well as the consequences such migration has on female work outcomes. For instance, using German data, Nisic (2009) finds that the employment outcomes of women who relocate following their partners depend on the labour market opportunities in the origin and

destination regions. Perales and Vidal (2013), analysing British data, show that gender discrepancies in the impact of spousal resources on couple migration decisions are influenced by structural inequalities in the labour market (such as occupational gender segregation). Using Swedish data, Branden (2013) finds that the fact that men's education impacts a couple's decision to move more than women's is related to a higher concentration of women in occupations with low wages and career potential.

2. The interrelation between migration and life course events

2.1 The life course approach in migration studies

While the theories outlined in the first section focus either on micro- (individual), meso- (family), or macro-level (institutional) factors determining the causes and consequences of migration, the life course approach implies a complex interplay between the individuals, their actions and biographies, and dynamics of social structures and institutions in the historical course of time. The recent shift towards such an approach has urged migration researchers to move beyond conventional techniques of analysis based on simplified assumptions (such as the homogeneity of (sub)populations, the independence of life events in one domain from events in other domains, and from the past) and to adopt methods that grasp the complexity and dynamic nature of individual life histories (Kulu & Milewski, 2007). The life course approach has thus allowed the researchers to look at migration as institutionally framed and implicitly embedded in individual biographies and societal structures, paying attention to the importance of the timing and interdependence of various events and, as a result, to obtain a complete picture of the causes and consequences of GM, including its cumulative effects.

The origins of life-course studies can be dated back to the studies of the Chicago School of Sociology in the early 20th century. Inspired by a classic work of Thomas and Znaniecki on Polish peasants in Europe and America (1918–20), researchers began to use life records to analyse social change and the life trajectories of individuals (Elder, 1985b: 24). In its current form, the life-course approach developed in the 1960s as a consequence of advances in theory, data resources, and methods (Elder, 1985a: 15–16). First, radical social change during the decade induced new questions on the associations between an individual's life history, the historical context, and the cohort. Second, the greater

availability of longitudinal data allowed to gain a ‘holistic’ picture of life trajectories, considering biographical events simultaneously and not as separate patterns. Third, the techniques of life course analysis were developed, starting with simple causal models and path analysis and shifting to complex event-history analysis.

The key advantage of the life course over the earlier use of the snapshot perspectives of individuals at a single point in time is that it focuses on transitions between the states and roles, on the process of change, where age is important, but is no longer the defining characteristic of the changes that occur. According to Elder et al. (2003), the life course paradigm is based on five heuristic principles: 1) *life-long development*: development does not end with adulthood, but goes on over the entire life course; 2) *agency*: individuals make choices within constraining opportunity structures, 3) *time and place*: historical and geographical context shape individual life courses, 4) *timing*: causes and consequences of events in the life course depend on their timing in the life course, and 5) *linked lives*: lives are lived interdependently within networks of shared relationships. The multidimensionality of lives, including parallel and interdependent work, family, residential, and health trajectories was underlined as an additional sixth principle.

Migration, from a life course perspective, can be viewed as a response to biographical events, an adjustment bringing the household into equilibrium following the changes in occupational, educational, or family domains. It has been shown that migration often takes place in connection with such events as enrolment in the educational system (Panichella, 2013; Tosi, et al., 2018), starting a new job (Mocetti & Porello, 2010; Widmer & Schneider, 2006), divorce (Dieleman & Schouw 1989), marriage (Mulder & Wagner, 1993; Odland & Shumway, 1993), and family composition change (Withers, 1998). However, not all changes in life domains are anticipated, therefore the life-course perspective also draws attention to the variability and unpredictable nature of individual biographies (Rindfuss et al. 1987).

2.2 The interdependencies between marriage and migration

Marriage might lead to relocation for two reasons. First, by definition, at least one of the partners is constrained to move to start a co-residential relationship. Either one of the partners moves in with the other partner or both of them move to a joint home (Brandén & Haandrikman, 2019; Flowerdew & Al-Hamad, 2004). Second, union formation implies

the establishment of a larger household requiring more space than the two pre-union households. These residential changes are partially enabled by financial benefits deriving from co-residence such as a larger household income (assuming that both partners work), pooled resources, increased levels of housing consumption (Helderman, 2007), and the benefits of economies of scale (Feijten & Mulder 2005).

Previous research has shown that the link between marriage and migration is not straightforward since it is important to distinguish between “event moves” (e.g., moves related to the event of getting married) and “state moves” (e.g., the status of being married). Several studies have found that the event of marriage leads to increased levels of migration whereas married individuals have a reduced likelihood of relocating (Jang et al., 2014; Michielin & Mulder, 2008; Mulder & Wagner, 1993; Odland & Shumway, 1993). Furthermore, the rates of migration decrease significantly as family size increases which is explained by economic and psychological factors (Sandefur & Scott, 1981). On the one hand, the economic cost of a move rises as the number of individuals living in a family increases. On the other hand, and more importantly, the presence of additional members in the family means that more ties must be broken at the place of origin and established at the destination.

Another complexity is that migration and marriage often occur as synchronized events. This means that a migration event might take place either at the same moment as marriage or in some short period before or after union formation. The concept of synchronized events permits distinguishing between the immediate impact of an event and the long-term effect of occupying a status. In other words, in the case of marriage and migration, it allows determining to what extent the difference in migration behaviour of married and unmarried individuals results from the simple fact that unmarried people “run the risk” of relocating together with marriage. It was shown that the dependence of short- and long-distance migration on age is substantially reduced if marriage is treated as a synchronization variable (Mulder & Wagner, 1993). Furthermore, the finding that married individuals are less likely to migrate than unmarried ones is reversed at short distances if marriage is considered as an event influencing the likelihood of another. The concept of synchronized events could also be useful to distinguish the effect of migration from the effect of marriage on labour market outcomes of women. While it is well known that women who marry and move are penalized in terms of labour market outcomes, the

question still remains whether or not they face negative outcomes compared to women who marry and do not move, and what are the long-term effects.

There are two features of the marriage-migration link that have not been yet considered by the previous research. First, marriage is often preceded by a period of cohabitation which might also involve migration. Nevertheless, most panel data do not allow the analysis of migration dynamics before marriage due to the absence of information on the period of cohabitation. Second, it has been shown, that partners often move sequentially and several years apart which can be a way to reduce the costs and risks of the migration project (Green et al., 1999; OECD, 2017; Impicciatore & Panichella, 2019). This means that family separation might take place before marriage. However, no studies dedicated to tied migration have analysed the impact of male partner relocation on the labour market outcomes of women in the place of origin during the period of family separation. Therefore, future research on migration dynamics and outcomes can be enriched by analysing these aspects.

2.3 Long-term effects of family migration

It should be noted that a limited number of studies on tied migration have analysed the long-term impact of this phenomenon on the labour market outcomes of women. Clark and Withers (2002) found that migration reduces the employment of married women in dual-earner couples by up to 10% in the months leading up to migration and by over 20% immediately after migration, although these effects were short-lived since the recovery to premigration employment levels took nearly one year. At the same time, a longitudinal analysis of family migration in Great Britain and the US by Cooke et al. (2009) showed that family migration had a significant impact on the earnings of married women for several years after a move. In GB, earnings never returned to their premigration level. Even though they did return to premigration levels in the US, the recovery took several years, and the lost earnings were never compensated. Moreover, it was shown that women's income recovers even more slowly if childbirth was registered in the migration interval (Clark & Huang, 2006).

The expectation of the long-lasting negative effect of tied migration on females' employment opportunities and earnings is suggested by a mechanism of cumulative advantage or disadvantage (Diprete & Eirich, 2006). According to this mechanism, the

initial socio-economic advantage of an individual (in the form of capital and resources), accumulates throughout the life course and tends to result in a position of greater advantage in later life. Similarly, a disadvantaged position in the early stages of life is likely to result in even lower socio-economic status later. A number of studies have shown that the spells of unemployment have long-term “scarring” effects because they reduce the future probability of being hired and incur a setback in re-employment earnings that persist long after the initial unemployment occurrence (e.g., Arulampalam, 2001; DiPrete, 1981; DiPrete & McManus, 2000; Gangl, 2004).

Two key mechanisms have been offered by the literature to uncover the process of unemployment scarring: “resource-specific” and “stigma-related”. The “resource-specific” mechanism, deriving from the human capital theory (Becker, 1993), implies that wage losses following an unemployment spell are associated with the process of human capital depreciation and skill relocation. Theory suggests that one can distinguish two types of human capital: generic human capital, gained through education and transferable across employers, and specific human capital, obtained through job-specific experience in a certain firm or sector and non-transferable across employers (Becker, 1993). While the first type loses its value over longer spells of unemployment, the second type depreciates immediately resulting in lower levels of productivity. Furthermore, the longer and more frequent the unemployment periods, the larger the scars on re-employment wages (Gangl, 2004; Gregory & Jukes, 2001). Since labour market trajectories of women are characterised by more frequent interruptions because of the periods of childbearing and caring, they are more likely to accumulate a reduced amount of work experience (Gupta & Smith, 2002; Gangl & Ziefle, 2009). This gender difference might be further amplified by the fact that women are more likely than men to be tied migrants facing the risk of unemployment following the move. In addition, longer and more frequent unemployment spells result in a higher risk of switching to lower-paying jobs or jobs located in other industries which is especially true for women (Aisenbrey et al., 2009). It is also known that the effects of unemployment scarring are short-lived with re-employment in occupations, sectors, or industries that are similar to that before unemployment (DiPrete, 1981) and long-lasting when re-employment is located in jobs outside of the worker’s discipline or sector (Kuhn, 2002; Mühleisen & Zimmermann, 1994; Stewart, 2007).

According to the “stigma-related” mechanism, deriving from the signalling theory (Spence, 1973), group differences in wages emerge from the information asymmetry related to the hiring process. Given that hiring decisions are made in situation of uncertainty about a worker’s productivity, employers rely on observable characteristics, such as age, ethnicity, family situation, as well as previous employment history (Lockwood, 1991; Eliason, 1995). Interrupted employment trajectories might be viewed by employers as a signal of low ability or low motivation and, thus, lead to a lower probability of being hired. Furthermore, existing literature shows that employers’ hiring decisions are strongly influenced by one’s parenthood status (e.g., Budig & England, 2001; Budig & Hodges, 2010, Correll et al., 2007) in the way that women with children are considered by employers as less productive and less competent, while fathers are expected to work hard and are viewed as more committed to their work (Ridgeway & Correll, 2004). In addition, it has been shown that migration is associated with an elevated probability of childbearing in the period following the move (Singley & Landale, 1998; Andersson, 2004), which means that migrant women are particularly at risk of being discriminated against by employers and facing long-term scarring effects on employment and earnings.

Finally, migration background may also serve employers as a signal of future productivity and result in discriminatory practices in several ways. First, the ambiguity related to the recognition of educational achievements or titles that are specific to certain occupations creates difficulties in assessing the skills of immigrant candidates in the hiring process (Chiswick, 1991). Second, language imperfections in speaking and writing fluency may cast doubts about the ability of non-native candidates to perform in high-skilled jobs (Chiswick, 1991; Dustmann & Fabbri, 2003). Third, in accordance with the theories of social closure (Blumer, 1965; Tomaskovic-Devey, 1993) employer’s stereotypes are based on the normative ideas that they share about the economic and social position of the group to which they belong. This means that employers belonging to a group with a higher economic and social position (i.e., the native group), might have negative expectations about the productivity of an immigrant employee coming from a lower socioeconomic background and having more common unemployment spells.

The described mechanisms of employment scarring suggest that migration is likely to result in a cumulative disadvantage over the life course for partnered women rather than

men or single women. At the same time, a longitudinal study using Dutch data shows that scarring effects among women do not accumulate with the duration and repetition of unemployment while this is true among men (Mooi-Reci & Ganzeboom, 2015). Moreover, for women, unemployment scarring is the largest after the first unemployment event and less prominent in the following interruptions, whereas for men it changes over the course of unemployment repetitions and its duration. The authors attribute this finding to the fact that women tend to switch to more “motherhood-friendly” sectors after the first job interruption (Aisenbrey et al., 2009, Gupta & Smith, 2002), which means that the costs of foregone skills and benefits are the highest after the first job interruption and less prominent in the following unemployment spells.

3. Empirical strategy and research aims

Despite a large number of studies on the topic of “tied migration”, it still remains mainly a theoretical argument, only partially tested by empirical research due to the limited availability of panel data on residential, family, and employment histories both in the country of origin and in the host society. As it was shown in section 2, the importance of such data is related to the fact that migration is closely connected to the events in parallel careers in the life course, such as the beginning of higher education or a job, union formation, and divorce (Mulder & Wagner, 1993). This means that a migration event might occur simultaneously with a parallel event or in a short time before or after it. Taking into consideration this synchronization could allow distinguishing between the effects of migration and marriage. While it is well known that women who marry and move are penalized in terms of labour market outcomes, the question still remains whether or not they face negative outcomes compared to women who marry and do not move, and what are the long-term effects. Furthermore, most studies on tied migration have focused exclusively on married couples, whereas the synchronization between marriage and migration suggests that migration might take place right before the marriage, thus being part of the family formation process. Therefore, neglecting the period of cohabitation might lead to an incorrect definition of tied migration. Finally, it has been shown, that partners often move sequentially and several years apart (Green et al., 1999; OECD, 2017), which means that family separation might take place before marriage. However, no studies so far have analysed the impact of male partner migration

on the labour outcomes of women in the place of origin during the period of family separation.

The use of a large comparative panel dataset (SHARELIFE) allows the author to overcome the limitations of the previous research owing to the availability of retrospective information on one's residential changes, employment, and family dynamics. The study aims to answer the following research questions: (1) Are women who engage in tied migration, relocating after their partners, penalized more than those who move alone or before their partner (lead migrants) or at the same time with him (equal migrants)? (2) Can women's education mitigate the negative effect of tied migration on their employment probability? (3) How does the interplay between family migration dynamics and family behaviours foster the process of accumulation of (dis)advantages over the life course?

With respect to the first research question, it is expected that partnered women who decide to migrate are penalized compared to single female migrants (*hypothesis 1a*). While for single movers the decision to relocate is based on comparing only individual costs and benefits, for partnered women it implies a more complex consideration accounting for the outcomes for the whole family and involving the coordination of own interests and preferences, employment, and earning capacities with those of their partner. Furthermore, it is expected that tied movers relocating in response to their partner's move, is the most disadvantaged category that is less likely to be employed in the host region compared to lead or equal migrants (*hypothesis 1b*). These are women for whom migration is associated with individual utility losses but who expect these losses to be compensated by the overall increase in family utility. In such a situation a woman's partner, expecting individual gains from relocation, moves first to explore the new environment and build the economic ground for the following migration of his female partner. The women migrating at the same time with their partners (equal migrants) are likely to gain less from migration compared to lead migrants, however, their returns are sufficient to decide to relocate.

As for the second research question, on the one hand, it might be expected that tertiary-educated women face relatively larger penalties in case of tied migration (*hypothesis 2a*) since higher levels of education are associated with more specialized qualifications and careers which might make it difficult to find suitable opportunities in a new place. On the

other hand, highly educated women might be better informed about employment opportunities in other regions, rely on wider social networks, and integrate culturally and economically faster and more easily compared to less educated women. Furthermore, it has been shown by empirical evidence that women might use their human capital to impede family migration bringing unfavourable outcomes for their careers (Shauman, 2010). Thus, an alternative expectation is that higher levels of education might allow women to alleviate the negative effects of tied migration (*hypothesis 2b*).

With respect to the long-term effects of family migration, it is expected that the initial disadvantage of women relocating in response to their partner's migration is amplified over time (*hypothesis 3*). This expectation is suggested by the cumulative (dis)advantage (Diprete & Eirich, 2006) mechanism, according to which the initial socio-economic (dis)advantage of an individual accumulates throughout the life course and tends to result in a position of greater (dis)advantage in later life. Similarly, the "employment scarring" effect implies that unemployment spells (which are expected to be more likely for tied movers) reduce the future probability of being hired.

The analytical strategy adopted to address the research questions of this study consists of three steps. In the preparation step, the Coarsened Exact Matching (CEM) procedure (Iacus et al., 2012) is implemented to reduce the degree of data unbalance and model dependence. In the first step, the impact of different internal migration patterns interacted with civil status on female employment opportunities is analysed. A novel measure of family migration, capturing the period of cohabitation and sequential migration, allows to conduct a more refined test of the tied migration hypothesis, as well as to estimate the impact of family separation on female employment. In the second step, the heterogeneity of the effects of migration patterns by educational level is examined. In the third step, the study proceeds with analysing the change in female employment probabilities over age, comparing various migration simulated scenarios, to test whether they might foster cumulative (dis)advantages over the life course (DiPrete & Eirich, 2006).

4. Data, variables and methods

4.1 Data

The study is based on SHARELIFE data, a retrospective survey focusing on people's life histories including all the important areas of respondents' lives, ranging from partners and children to housing and work history to detailed questions on health and health care. The two waves (w. 3, release 7.0.0, and w. 7, release 7.0.0) were merged and harmonized. Women were linked to their partners which allowed the author to consider migration as a family rather than an individual event, distinguish various migration scenarios, and avoid underestimation of the negative effect of family migration on women's employment status (Boyle et al., 2001). The analytical sample is based on the selection of eight European countries (Sweden, Czech Republic, Poland, Germany, France, Italy, Spain, Greece) and women of 20-55 years. The observations with missing cases on independent and control variables introduced below were excluded, which yielded an analytical sample of 431,995 observations from 14,520 women.

The dependent variable is a dummy for being employed. The independent variable is constructed based on different combinations of civil status and patterns of interregional migration at NUTS-2 level, commonly adopted as a unit of analysis in the literature on geographical mobility and, thus, guaranteeing better comparability with existing research on the topic. The independent variable is time-varying and has eight main categories: 1 - *Single stayers*, 2 - *Single movers*, 3 - *Couple stayers*, 4 - *Couple: both partners migrated at the same time*, 5 - *Couple: only male migrated*, 6 - *Couple: only female migrated*, 7 - *Couple reunion (female tied)*, 8 - *Couple reunion (male tied)*; and four residual categories: 90 - *a male partner moving to the place of residence of a female partner*, 91 - *a female partner moving to the place of residence of a male partner*, 92 - *divorced or widowed women*; 93 - *partners migrating at the same time in different directions*. Figure 7 shows possible changes in the independent variable over time. At point "zero", all women are considered single. Some of them might remain single and migrate or stay in their place of origin. Others might get married or engaged. Further, the partners might either remain in the place of origin, move together, or migrate sequentially with the following reunion. In addition to the eight categories, there were distinguished four residual groups, the results for which are not reported due to the small number of observations. The residual

categories included the following cases: either a man or a woman migrated to the place of residence of his/her partner for cohabitation; both partners moved at the same time but to the different places; divorced women.

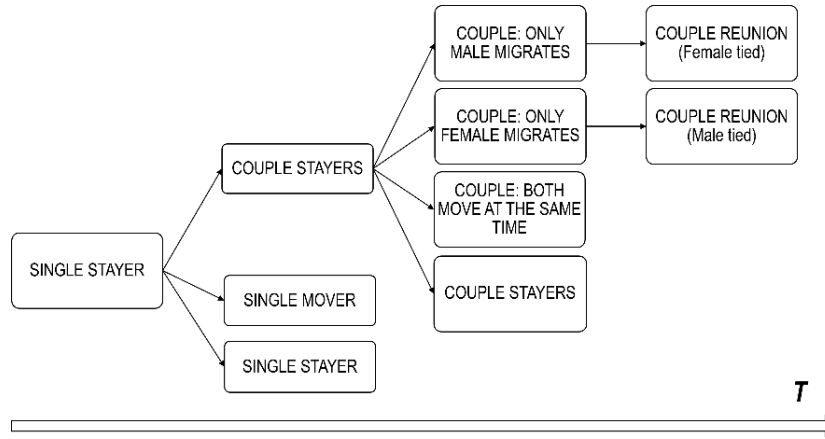


Figure 7 - Independent variable.

4.2 Coarsened exact matching

Before estimating the statistical models, the Coarsened Exact Matching (CEM) procedure was employed in order to balance the treated (movers) and control groups (non-movers) on a set of pre-treatment variables: cohort, country, education, and social class of origin. The procedure is aimed at obtaining more efficient estimates by reducing the degree of imbalance and model dependence. The basic idea of CEM is to coarsen each variable by recoding so that substantively indistinguishable values are grouped and assigned the same numerical value (Iacus et al., 2012). Further, the “exact matching” algorithm is implemented to the coarsened data to define the matches and to prune unmatched units. Finally, the coarsened data are dismissed, and the original (uncoarsened) values of the matched data are kept. In other words, after coarsening, the CEM algorithm creates a set of strata having the same coarsened values of X. Units in strata that contain at least one treated and one control unit are retained, while the units in the remaining strata are discarded from the sample. To compensate for unequal numbers of treated and control units within a stratum, the procedure requires weighting observations according to the size of their strata.

T^s is used to indicate the treated units in the stratum s and $m_T^s = \#T^s$ to denote the number of treated units in the stratum, similarly for the control units, that is C^s and $m_C^s =$

$\#C^s$. The number of matched units are $m_T = \sum_{s \in S} m_T^s$ for the treated and $m_C = \sum_{s \in S} m_C^s$ for the controls. To each matched unit i in stratum s the following weight is assigned:

$$w_i = \begin{cases} 1, & i \in T^s \\ \frac{m_C}{m_T} \frac{m_T^s}{m_C^s}, & i \in C^s \end{cases}$$

Unmatched units receive weight $w_i = 0$ which therefore allows to eliminate all imbalances.

CEM holds several properties that make it preferable to other matching methods. First, it belongs to the class of Monotonic Imbalance Bounding (MIB) matching methods. This means that the balance between the treated and control groups is chosen by the researcher ex-ante rather than discovered through the usual arduous process of checking and repeatedly rerunning the matching procedure. It ensures that adjusting the imbalance on one variable has no effect on the maximum imbalance of any other. Second, while many matching methods (including propensity score and Mahalanobis distance matching) work on a metric different from the original data violating the congruence principle, CEM operates in the space where X was created and its variables were measured, regardless of whether the data are continuous, discrete, or mixed. Meeting the congruence principle allows a researcher to leverage his/her substantive knowledge of the data to find better matches. Third, CEM automatically restricts the matched data to areas of common empirical support which eliminates the possibility of difficult-to-justify extrapolations of the causal effect that may become heavily model-dependent (King & Zeng, 2006). Finally, CEM is extremely fast computationally, even for large datasets.

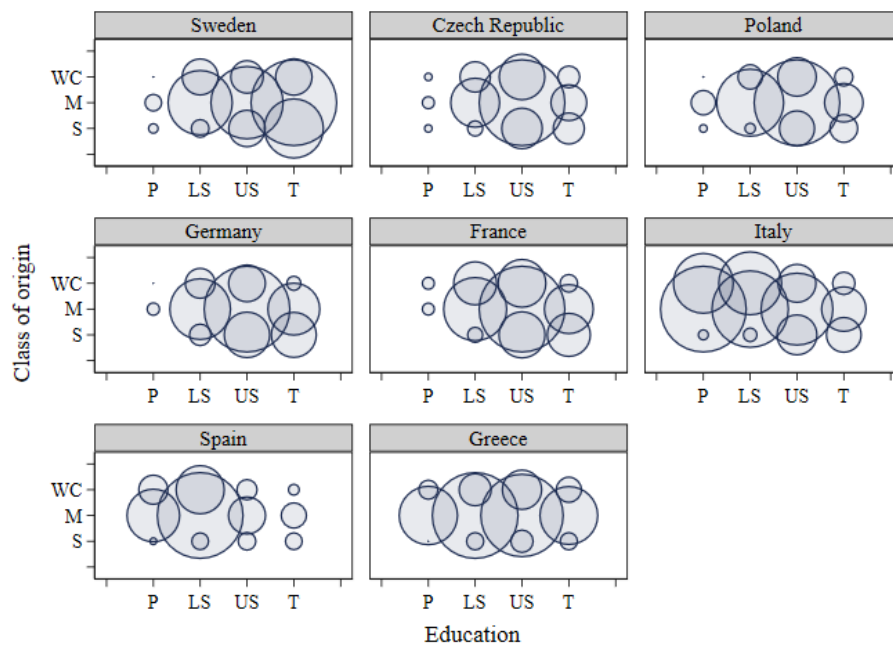


Figure 8 - CEM strata (Class of origin: WC – working class, M – middle class, S – service class; Education: P – primary, LS – lower secondary, US – upper secondary, T – tertiary).

Figure 8 shows the distribution of treated units across the strata defined by the CEM method. The larger the circle corresponding to a stratum, the higher the number of treated units in that stratum. The figure also reflects the heterogeneity of migrants' selection across the countries. For example, in Italy, the majority of migrants are primarily educated, in Spain, most of the migrants are individuals with lower-secondary (or lower) education, while in Sweden, the majority of movers are tertiary-educated. These country differences in the selectivity of migrants might be related to the fact that Southern European countries are characterized by the movements from rural to urban areas offering better employment opportunities (e.g., Panichella, 2014), whereas in northern European countries the geographical mobility is more likely to take place among urban areas or big cities. Figure 9 reports the bounds within which the matched comparisons were made through the CEM procedure. The strata that did not contain at least one control and one treated unit were all “pruned” from the analysis, while all the other strata were weighted based on the number of observations of the two groups. As a result, this procedure allowed to obtain more efficient estimates of the effect of migration on employment probability.

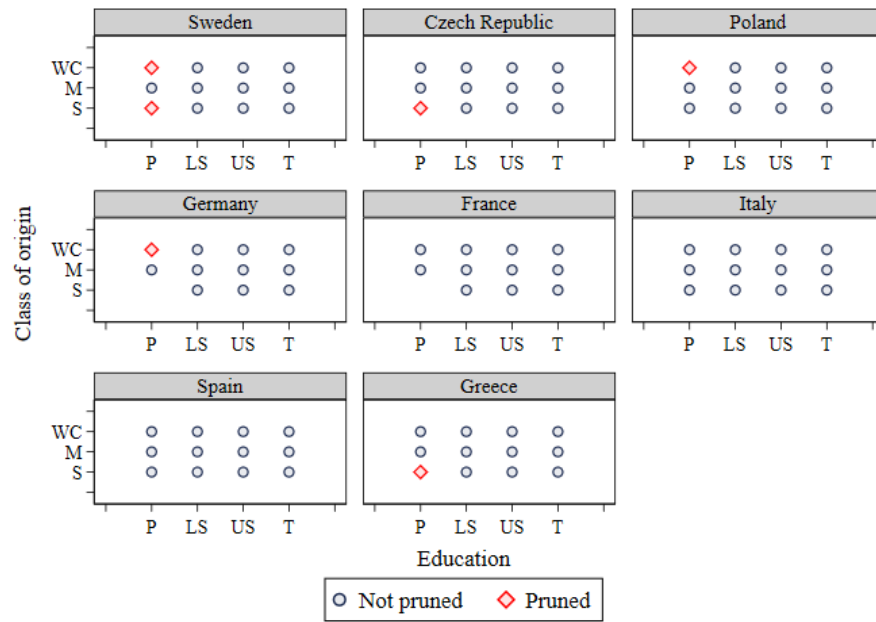


Figure 9 - CEM – imbalance evaluation (Class of origin: WC – working class, M – middle class, S – service class; Education: P – primary, LS – lower secondary, US – upper secondary, T – tertiary).

4.3 Methods

In the first step of the analysis, the impact of different internal migration patterns on female employment opportunities was estimated through a hybrid model (Allison, 2009). A hybrid model is a random effects model where time-varying predictors are decomposed into between- and within-components. This model allows for overcoming “a major drawback” of a fixed effects model, that is the impossibility of estimating the effects of time-constant variables. The model, thus, controlled for time-constant variables: social class of origin (operationalized through dominance principle and having three categories: working, middle (white collars and petty bourgeoisie), service class), educational level (lower secondary or less, upper secondary, tertiary), region of origin (at age 15) NUTS-2, area of origin: urban or rural (at age 15), cohort (coded in three categories: 1920-1940s, 1950s, 1960s), as well as for time-varying variable age. The model can be specified as follows:

$$Y_{it} = \alpha + \beta(X_{it} - \bar{X}_i) + \gamma\bar{X}_i + \partial Z_i + \alpha_i + \varepsilon_{it} \quad (7),$$

where Y_{it} is the probability of being employed, β estimate reproduces exactly the fixed-effects estimate, X_{it} is the vector of time-varying controls, γ estimate reproduces (approximately) the between-effects estimate, Z_i is the vector of time-constant variables, δ is the effect of time-constant regressors, ε_{it} is time-varying error term (idiosyncratic error term), α_i is a person-specific time-constant error term.

In the second step, fixed effects (FE) models were estimated separately for three groups of women depending on their educational level. Fixed-effects estimates allow to solve the problem of unobserved heterogeneity and obtain unbiased estimates under the assumption that the unobserved characteristics and their effect on the outcome of interest are time-invariant. It is well known in the migration literature that individuals who relocate may be selected on some unobserved characteristics (for instance, motivations, and cognitive skills). If these unobserved traits are also correlated with labour market outcomes, such as employment, ordinary least squares (OLS) estimates will be biased. Furthermore, couples may also have unobserved characteristics that make them more or less inclined towards gender specialization, and these attitudes towards gender roles may influence the decision to move. The fixed effects models can be specified as follows:

$$(Y_{it} - \bar{Y}_l) = \beta(X_{it} - \bar{X}_l) + (\alpha_i - \bar{\alpha}_l) + (\varepsilon_{it} - \bar{\varepsilon}_l) \quad (8),$$

where X_{it} is the vector of time-varying regressors (age, mobility pattern), ε_{it} is a time-varying error term (idiosyncratic error term), α_i is a person-specific time-constant error term. Since demeaning wipes out person-specific time-constant unobserved heterogeneity, $(\alpha_i - \bar{\alpha}_l) = 0$.

Finally, FE models with interaction terms between the independent variable and age squared were implemented to estimate seven simulated scenarios shown in Table 9. For instance, the “*Single mover*” scenario implied that a non-married woman migrated at the age of 23. According to the “*Couple - stayers*” scenario, a woman got married or engaged at the age of 23 and neither she nor her partner had ever experienced a move. The “*Female tied migrant*” scenario refers to the situation when a woman got married or engaged at the age of 23, her partner migrated when she was 28, and she moved at the age of 33 to reunite with him. The two scenarios – “*Couple - only male migrated*”, “*Couple - only*

female migrated” – imply the period of family separation which, in the case of “*Female tied migrant*” and “*Male tied migrant*”, is followed by reunification.

Table 9 - Migration scenarios.

Migration scenario	Marriage/engagement*	Women's migration*	Men's migration*
Single mover	no	23 years	n/a
Couple-stayers	23 years	no	no
Couple-only male migrated	23 years	no	28 years
Couple-only female migrated	23 years	28 years	no
Couple-joint migration	23 years	28 years	28 years
Female tied migrant	23 years	33 years	28 years
Male tied migrant	23 years	28 years	33 years

*Age of a woman

5. Results

5.1 Employment opportunities of women across various migration patterns

Table 10 shows the results obtained from the hybrid model, where the reference category is “*single stayer*”³. GM has a positive impact on employment only for single women (0.03 p.p.), although on average among females this effect is not significant. In contrast, married or engaged women are penalized across all migration patterns, especially when they are “*tied movers*”. Thus, the results confirm hypotheses 1a and 1b. In the situation when a woman reaches her immigrated partner, the within-group estimate of disadvantage with respect to single women who have never experienced GM is -0.12 p.p. However, the between-group estimate is not statistically significant. The results also show a negative impact of family separation on the employment probability of women, either when a female (“*Couple - only female moved*”) or a male partner (“*Couple - only male moved*”) migrates first. The between-group estimate of family separation is particularly large (-0.16 p.p.) in the situation when a male partner relocates but a woman remains in her place of origin. Finally, the only scenario where both within- and between-group estimates are not statistically significant is the reunification of a male partner with his immigrant partner.

³ Full table (Tab. A10) is provided in the Appendix to Chapter 3

Table 10 - Results from the hybrid model (ref. “single stayers”).

VARIABLES	Between		Within	
	β	σ	β	σ
Single - mover	-0.02	(0.01)	0.03***	(0.01)
Couple - stayers	-0.11***	(0.01)	-0.03***	(0.00)
Couple - only M moved	-0.16**	(0.07)	-0.03***	(0.01)
Couple - only F moved	-0.08	(0.06)	-0.05***	(0.01)
Couple - both migrated at the same time	-0.15***	(0.02)	-0.03***	(0.01)
Reunion (F tied)	-0.53	(0.85)	-0.12***	(0.02)
Reunion (M tied)	-0.91	(0.96)	-0.02	(0.03)

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Results obtained from the fixed effects models (Figure 10) show a greater heterogeneity in the impact of migration patterns among the least educated women. Women with upper secondary or lower education, are strongly penalized when they are “tied migrants” (-0.24 p.p. and -0.22 p.p. respectively). They also face negative outcomes, although of lower magnitude, in the period of family separation following their partner’s migration (-0.08 p.p. and -0.14 p.p. respectively), as well as when they migrate at the same time with their partner (-0.09 p.p. and -0.14 p.p. respectively). In contrast, tertiary-educated women get benefited across all migration patterns, even when they are “tied movers” (0.27 p.p.). Moreover, it is interesting to note that “*single mover*” is the least beneficial scenario (0.22 p.p.) for highly educated women, in contrast to joint migration with their partners (0.38 p.p.) and family reunion after a woman’s migration episode (0.35 p.p.). These results confirm hypothesis 2b, suggesting that tertiary education allows women to compensate negative effects of tied migration, while for women with lower levels of educational attainment tied migration scenario leads to cumulative disadvantages. Such outcomes might be explained by the fact that tertiary-educated women are either more successful in adapting to new places and finding better job opportunities due to the higher levels of human capital compared to lower-educated women, or able to bargain better outcomes in negotiations with their partners and migrate only if this decision brings employment benefits. Future studies might further explore the underlying mechanisms of compensatory effects for highly educated women in contrast to cumulative disadvantages of lower educated women.

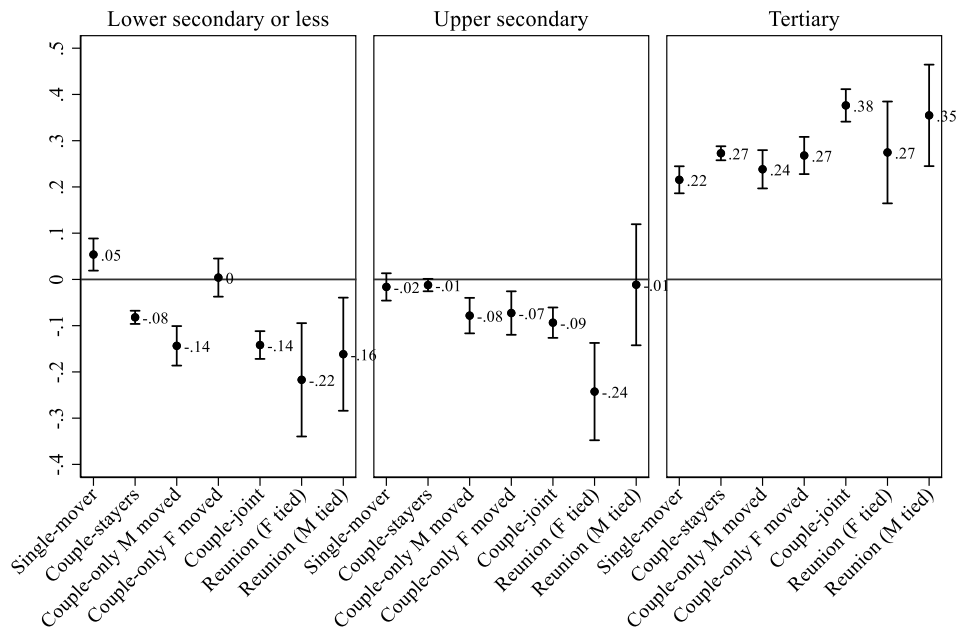


Figure 10 – Beta coefficients for independent variable – mobility pattern (ref. “single stayers”). FE models by education, control for age.

5.2 Results from simulated scenarios

Figure 11 shows the results obtained from seven simulated migration scenarios that were estimated over a 15-year period (from 20 to 35 years). The results confirm that the only beneficial scenario for women is “*single mover*”, although even in this case, the positive impact of GM is not substantial and disappears already two years after migration turning into a disadvantage compared to “*single stayers*”. For “*couple stayers*”, the employment is characterised by a sharp negative trend right after the marriage episode with respect to “*single stayers*”. Further migration of a male partner almost does not affect this trend, as it is shown in the scenario “*Couple – only male migrated*”. However, when it is followed by female partner migration (“*Female tied*” scenario), the relative probability of employment drops substantially, making this pattern the most penalizing.

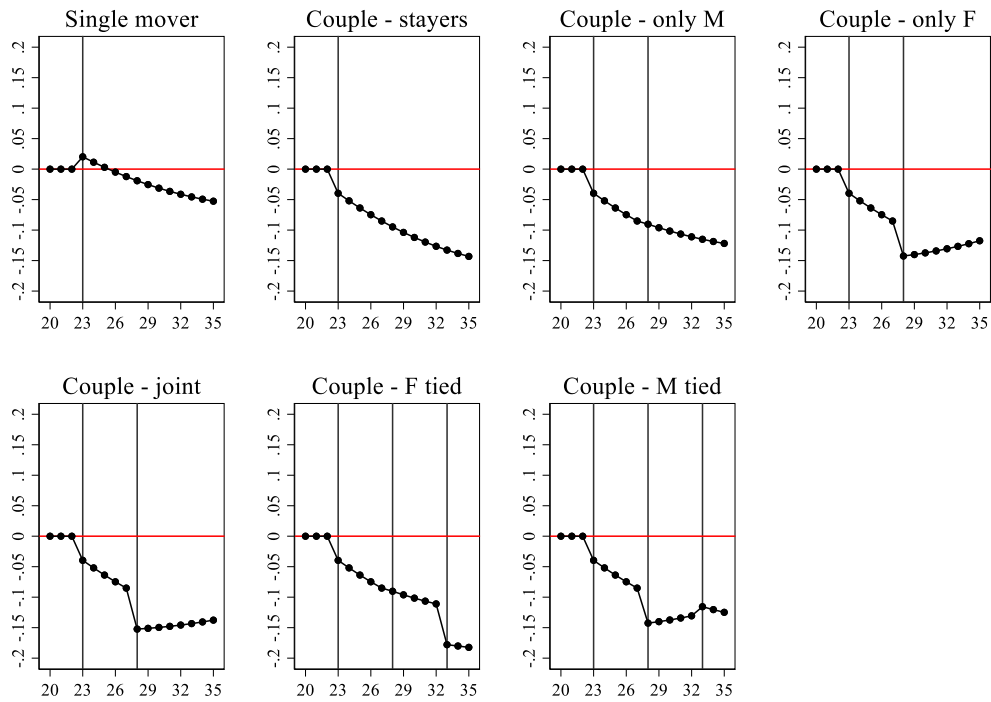


Figure 11 - Migration simulated scenarios over age (ref. “single stayers”).

In situations when a woman migrates first (“*Couple: only female migrated*”) or at the same time with her partner (“*Couple: joint migration*”), her relative employment probability worsens at the moment of migration but shows a slight improvement in the following years, which, however, does not eliminate the disadvantage compared to “*Single stayers*”. Finally, in a “*Male tied*” scenario, the migration of a male partner followed by a woman’s relocation gives an additional boost to the woman’s employment opportunities, which nevertheless takes a diminishing trend afterward.

To sum up, this analysis reveals that migration does not eliminate the long-term negative impact of family formation on women’s employment opportunities but creates heterogeneities within the group of single females and within the group of partnered ones. For single women, migration brings an advantage in terms of labour market attachment, which, however, does not accumulate but, in contrast, weakens over time turning into a disadvantage. For married or engaged women, the outcomes vary depending on the sequence of partner migration. When a woman takes the role of a lead migrant (i.e., relocates first) or moves at the same time with her partner (couple joint migration), she has an opportunity to partially compensate for a disadvantage related to family formation.

Finally, as expected by hypothesis 3, the tied migration results in the accumulation of disadvantage over age. That is, the initial negative impact of marriage/engagement is further amplified when a woman is constrained to follow her partner's relocation to the detriment of her own career, resulting in the so-called "unemployment scarring" effect.

6. Conclusions

Although GM provides an opportunity for individuals to find better job opportunities offered in other places and on average has a positive impact on occupational attainment, its outcomes are not the same for men and women. It has been shown that migration favours men rather than women, and the roots of this cleavage lie in the context of family. Numerous studies have found that partnered women are more likely than men to find themselves in a position of "tied migrant", relocating in response to their partners' movement and facing negative consequences in terms of their employment chances and earnings (e.g., Shauman & Noonan, 2007; Boyle et al., 2009; Clark & Huang, 2006; Geist & McManus, 2012; Jacobsen & Levin, 1997). On the contrary, empirical evidence shows that migration has a positive influence on career development and earnings of partnered men (e.g., Cooke, 2003; Jacobsen & Levin, 2000).

Several theories have been put forward to explain gender differences in the outcomes of family migration. The earliest research on family migration conducted by economists in the 1970s and sociologists in the 1980s primarily concentrated on internal determinants and decision-making within couples by relying on either microeconomic models of utility maximization and bargaining between partners or sociological theories of gender role ideology. Further theoretical explanations focused on the importance of considering the occupational context, namely occupational sex segregation, in shaping the mobility opportunities of men and women (Nisic & Melzer, 2016; Shauman & Noonan, 2007). Finally, the recent research in family migration has taken a transdisciplinary perspective emphasising the broader social and economic implications of family migration processes and considering the complex interactions between family dynamics, life course events, and migration decisions.

However, "*tied migration*" remains mainly a theoretical argument, which has been only partially tested by empirical research due to the limited availability of panel data on residential, family, and employment histories. The importance of such data is related to

the fact that migration is closely connected to the events in parallel careers in the life course, such as, for example, union formation (Mulder & Wagner, 1993). This means that a migration event might occur simultaneously with a parallel event or in a short time before or after it. Taking into consideration this synchronization could allow for a more nuanced analysis of migration patterns distinguishing between the effects of migration and marriage. Furthermore, longitudinal data are also crucial for capturing the phenomenon of sequential migration, that is, when partners move one after another, and its impact on labour market outcomes of women, which has not been considered by the previous studies.

The use of a large comparative panel data (SHARELIFE) allowed the author to overcome the limitations of the previous research owing to the availability of retrospective information on one's residential changes, employment, and family dynamics. Based on such data it was possible to distinguish various patterns and scenarios of interregional migration revealing heterogeneous outcomes, as well as to disentangle the impact of migration from the impact of marriage. Overall, the study has shown that the role of migration for female employment is limited. First, it does not eliminate the negative impact of family formation on women's labour market outcomes but creates heterogeneity within the group of single women and within the group of those who are married or engaged. The results revealed that the only beneficial scenario for women in terms of employment opportunities was "*single mover*", even though in the long run its positive impact disappeared turning into a disadvantage compared to "*single stayers*". In contrast, the worst outcomes were found for "*tied migrants*", confirming the existing empirical evidence. Moreover, the initial disadvantage of female "*tied migrants*" associated with marriage/cohabitation was amplified by a migration event and increased over age, which thus corroborated the "cumulative disadvantage" hypothesis. At the same time, "female lead migrant" scenario allowed married/engaged females to partially compensate for the accumulation of disadvantage. It should also be noted that, for the first time, the study analysed the impact of family separation on the employment outcomes of women. Either when a woman or a man migrated first, the effect of family separation was negative, although less substantial in magnitude compared to "*female tied migration*" pattern.

The second aspect pointing to the limited role of family migration is that its outcomes were not the same across educational groups, namely its negative effects were limited to upper-secondary and lower-educated women. In contrast, tertiary-educated women were able to avoid the negative consequences of GM and even get benefited across all migration patterns, even when they were “*tied migrants*”. These results might suggest that tertiary-educated women are either more successful in adapting to new places and finding better job opportunities due to the higher levels of human capital compared to lower-educated women, or able to bargain better outcomes in negotiations with their partners and migrate only if this decision brings employment benefits.

It should be noted that the study has several limitations that might be tackled by future research. First, the couple migration patterns are developed based on the relative timing of the moves of the partners. That is, for instance, a female tied migrant in this study is a woman who migrated after the move of her partner. This definition, however, does not take into account the decision-making process behind the move, as well as the reasons for relocation and motivations of the partners (the information that was not available in the dataset). Thus, it is not possible to know whether indeed the male partner's interest was the main driving force of migration, while a female partner was constrained to move to the detriment of her career. Moreover, it might be the case that some women move for the benefit of their children and explicitly choose to stay out of the labour market after migration in order to devote themselves to care duties. In this case, the reduction of employment opportunities is not, in the strict sense, a penalization for a woman. Thus, future research could focus on exploring the decision-making process and motivations related to family migration in order to understand better the underlying mechanisms. Second, the analysis does not take into account the relative occupational status, education, or earnings of the partners. For instance, it could be worthwhile to explore how the outcomes found in this study vary depending on whether a man or a woman is the main earner in the family, or on the patterns of assortative mating. Third, future research could build on this study by analysing the heterogeneity of family migration outcomes by countries. Cross-national variation might be influenced by institutional and cultural context, namely by the level of support towards female employment and normative expectations about appropriate gender roles (Vidal et al., 2017). In countries where policies offer scarce support for female employment and cultural beliefs undervalue

female work, women might have limited opportunities to affect family migration decisions, as well as to get a job after relocation. On the contrary, in countries with the prevalence of gender-egalitarian attitudes and policies aimed at supporting female employment (such as affordable childcare, and availability of flexible work arrangements) women might have a greater possibility to influence family relocations.

Appendix

Table A10 – The impact of mobility patterns on employment probabilities of women: results from hybrid models

VARIABLES	between	within
Mobility pattern (ref. Single stayer)		
Single mover	-0.02 (0.01)	0.03*** (0.01)
Couple - stayers	-0.11*** (0.01)	-0.03*** (0.00)
Couple - only M moved	-0.16** (0.07)	-0.03*** (0.01)
Couple - only F moved	-0.08 (0.06)	-0.05*** (0.01)
Couple - both migrated at the same time	-0.15*** (0.02)	-0.03*** (0.01)
Reunion (F tied)	-0.53 (0.85)	-0.12*** (0.02)
Reunion (M tied)	-0.91 (0.96)	-0.02 (0.03)
Res: a male partner moving to the place of residence of a female partner	-0.10*** (0.02)	-0.00 (0.01)
Res: a female partner moving to the place of residence of a male partner	-0.13*** (0.02)	-0.06*** (0.01)
Res: divorced or widowed women	0.02 (0.02)	0.02*** (0.00)
Res: partners migrating at the same time in different directions	0.04 (0.22)	-0.10*** (0.03)
Age	0.04*** (0.00)	0.00*** (0.00)
Age#age	-0.00*** (0.00)	-0.00*** (0.00)
Cohort (ref. 1920-1940s)		
1950s	0.05*** (0.01)	-
1960s	0.03*** (0.01)	-
Education (ref. Primary)		
Lower secondary or less	0.07*** (0.01)	-
Upper secondary	0.19*** (0.01)	-
Tertiary	0.13*** (0.01)	-
Social class of origin (ref. Service)		

VARIABLES	between	within
Middle	0.04*** (0.01)	-
Working	0.03*** (0.01)	-
Geographical area of origin (ref. Big city)		
Suburbs	0.01 (0.01)	-
Large town	-0.01 (0.01)	-
Small town	-0.02 (0.01)	-
Rural	-0.01 (0.01)	-
Constant	-0.29*** (0.07)	
Observations	431,995	
Number of id	14,520	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Chapter 4

Social Origin and Motherhood Employment Penalty. Heterogeneity by partners' resources and country context.

Family of origin and family of destination are both crucial factors influencing one's labour market outcomes. On the one hand, it is well established in intergenerational social mobility research that social origin exerts a substantial effect on one's occupational attainment (Blau & Duncan, 1967; Torche, 2011; Bernardi & Ballarino, 2016). On the other hand, the gender inequality research underlines the key role of parenthood in generating gaps in labour market outcomes among women, as well as between males and females (e.g., Budig & England, 2001; Gangl & Ziefle, 2009; Killewald, 2013). Despite substantial advances in educational levels and labour market participation rates, women still bear a major share of housekeeping and caregiving responsibilities incurring employment interruptions, reduced working hours, skill attrition, foregone experience, and training. Moreover, even when these individual factors are accounted for, the motherhood penalty remains. This residual part is often linked to discrimination practices on the part of employers (Correll, et al. 2007) perceiving women with children as less committed and less productive.

Several studies have analysed how educational level affects women's employment (e.g., Steiber et al, 2016; Evertsson et al., 2009), while no research has been done on the impact of family background on the motherhood penalty, net of education. The direct effect of social origin might have consequences for mothers' employment chances through access to social networks, employers' favouritism, inheritance of family business or financial resources, which might result in a cumulative or double disadvantage for women from less privileged family backgrounds or compensate the penalty for women from better-off origins. Moreover, the effect of social origin might vary depending on the factors related to the family of destination, such as the partner's resources (his education and/or occupational status). Empirical evidence has shown that the husband's social standing has a negative impact on a woman's employment in couples where a male partner has a comparative advantage in terms of education or occupational status, whereas

it exerts no effect in high-status homogeneous couples (Bernardi, 1999; Vandecasteele & Esche, 2015). At the same time, to the best knowledge of the author, there is no evidence on how partner's resources interact with a woman's social origin, net of her education, and whether this interaction creates an additional source of cumulative (dis)advantage.

On top of the individual-level factors, the employment of mothers is determined by the macro context characterised by the country's family policies, gender norms, and labour market structure and regulations. Although there is a large number of studies that investigate cross-country differences in women's employment (e.g., Pfau-Effinger, 2012; Stier et al, 2001; Fortin, 2005), as well as the studies that model female labour supply based on micro-data in single countries, limited attention has been paid to the variation in the impact of individual factors by national contexts. On the supply side, macro-level factors might affect the relationship between motherhood penalties and social origin by shaping the opportunity structure of women with children. The role of parental resources, such as networks and financial support, might be particularly important for arranging childcare and maintaining labour force attachment in countries with weak state support for female employment, traditional gender norms, limited secondary segment, scant part-time opportunities, as well as strict employment protection regulation. On the demand side, macro-level factors might influence the association between motherhood penalties and social origin through shaping the employer's hiring and promotion decisions. In rigid labour markets, where dismissal costs are high and employers tend to make hiring decisions based on a scrupulous screening, taking into account the ascriptive characteristics of the candidates (such as parenthood status and gender), mothers from less privileged families might be particularly disadvantaged compared to their counterparts from better-off families. Moreover, advantaged backgrounds might mitigate the employers' statistical discrimination against mothers based on negative perceptions of their productivity and commitment, which might be particularly pronounced in countries with traditional gender norms and limited support for female employment.

Using the retrospective data SHARELIFE, this study aims to analyse the interplay between the family-of-origin (social class of origin) and family-of-destination factors (motherhood, partner's resources) in determining women's employment outcomes. First, it attempts to explore whether the motherhood employment penalty is attenuated by advantaged family background or aggravated by less privileged origins (net of education).

Second, it aims to investigate whether the DESO on motherhood employment penalty changes depending on the partner's resources. Third, it analyses how the DESO on employment of women with children differs across European countries. Thus, one of the key contributions of this study is that it makes the first attempt in analysing the role of social origin for mothers' employment chances by connecting the literature on social stratification to the research on gender inequalities and adding to the studies on cumulative (dis)advantage (Diprete & Eirich, 2006). While the previous chapter has considered the temporal dimension of cumulative (dis)advantages, in this study, the focus is on the status-resource interplay. The impact of social origin on one's labour market outcomes over and above education deserves attention in studies dedicated to motherhood penalties since it might exacerbate the disadvantage of women with children. Finally, this work contributes to the comparative literature on female employment by analysing how the interplay between the family-of-origin and family-of-destination factors might vary across European countries.

The study is structured as follows. The first section examines how individual- (such as education, social origin) and household-level (partner's resources) factors might shape mothers' employment chances. The second section is dedicated to the role of macro context, in particular, family policies, gender norms, and labour market regulation and structure, in determining women's employment. The third section outlines the research questions and relative hypotheses. The fourth section describes data and methods. The fifth section describes the results. The final section provides the main conclusions and limitations.

1. Motherhood and employment penalty

1.1 How education and social origin influence mothers' employment

Reduced employment rates of mothers are generally explained by the fact that women with children bear a greater burden of childcare, housework, and family responsibilities compared to fathers and childless women and men (Anderson et al. 2003; Gangl and Ziefle 2009; Budig & England 2001). However, not all mothers forego employment, which raises the question of which micro-level factors (both individual and household) facilitate maternal employment.

The key factor influencing maternal employment is education. First, according to human capital theory, more highly educated women are more likely to remain in paid work when they become mothers than their counterparts with lower levels of education since they have a greater wage potential and thus face higher opportunity costs of leaving the labour force (Becker, 1991). Moreover, lower-educated mothers are more likely to have less secure jobs and encounter a higher risk of involuntary non-employment (e.g., Erlinghagen, 2008; Gesthuizen et al., 2011). Second, highly educated women are more likely to have egalitarian attitudes towards gender roles, that is, they believe that paid and unpaid labour should be more equally divided between men and women and thus that women should work more for pay than they do now. In addition, they hold more favourable views on maternal employment and non-maternal childcare (Schaninger & Buss, 1986). Third, due to educational assortative mating they often have an equally highly educated partner with similar attitudes (Kanjii, 2013; Blossfeld & Drobnič, 2001), which fosters less traditional roles in the household (Bolzendahl & Myers, 2004). In addition to that, education can enhance women's bargaining position in the household, allowing them to obtain greater support from their partner (Brynin & Francesconi, 2004) and ultimately easing reconciliation. Finally, highly educated women are more likely to afford reliable childcare or housekeeping services due to higher levels of income, thus reducing the possible conflict between work and care/household responsibilities.

While several studies have considered the role of education for maternal employment, to the knowledge of the author, no research has been done with respect to the impact of social class of origin on motherhood penalties. The literature on social stratification has pointed out that family background exerts a strong influence on one's occupational achievement and income even when education is controlled for. This effect has been termed the direct effect of social origin (DESO) (Blau & Duncan, 1967; Torche, 2011; Bernardi & Ballarino, 2016). When it comes to women's labour market outcomes, the mechanisms underlying DESO are important to consider since they might allow women from better-off families to compensate for the negative effects of motherhood. First, mothers with advantaged social origins might benefit from social networks, providing access to useful information on vacancies or facilitating decisions relating to hiring and promotion (Lin et al., 2001). Second, they might receive financial support from their parents for entrepreneurial activities, directly inherit the family business, or get a job in a

family-run company when being involuntarily dismissed or not having other job opportunities. Third, mothers from better-off families might be more ambitious and sensitive to occupational success and, thus, more willing to return to paid work after childbearing.

In addition to that, in certain ways, the advantaged family background can serve as a signal of better productivity and commitment for employers which might offset or mitigate the discrimination against mothers. Employers might discriminate against mothers based on either statistical information or social norms and cultural beliefs. The first mechanism implies that measuring the productivity of each individual is costly and time-intensive, therefore employers prefer to pay higher wages or to hire individuals from a group that is expected to have higher productivity and is less likely to quit a job, that is childless women. The second mechanism entails the conflict between the normative demands on the ideal worker – to be constantly available for his or her employer – and the normative expectations on the good mother – to be constantly available for her children (Correll et al.: 1306). Qualitative and experimental studies have demonstrated significant bias against mothers when it comes to hiring and promotion decisions. It was revealed that employers question mothers' ability to work long hours (Rivera & Tilcsik 2016), perceive them as less competent and committed than equally qualified childless women, and are less likely to hire women with children (Benard & Correll 2010; Correll et al. 2007). Having an advantaged family background might offset the negative perceptions about mothers' productivity in several ways. First, individuals from better-off families might have better productivity-enhancing cognitive and non-cognitive skills (such as self-confidence, perseverance, conscientiousness, and extraversion) that are highly valued in the labour market but not reflected in formal educational qualifications (Karlson, 2019). Second, similar to the role of education, the impact of the social class of origin might be reflected in more economic resources at the disposal of mothers for obtaining quality childcare and thus having more time and energy to devote to paid work. Finally, employers might prefer to hire for better positions mothers from privileged backgrounds, all else being equal. This favouritism might be due to the employers' taste for discrimination based on social origin (Becker, 1971) or statistical discrimination.

Thus, although motherhood is associated with the increased demand for caring activities at home and therefore reduction of working hours and higher risk of

unemployment, the magnitude of this effect might not be the same across women of different educational levels and family backgrounds. Mothers from advantaged families and mothers with higher levels of education are expected to have greater chances of remaining in the workforce than their counterparts from less privileged backgrounds and with lower levels of education.

1.2 Household context: the role of the partner's resources

In addition to individual-level factors examined in the previous section, the probability of maternal employment can be affected by the household context, namely by the partner's social standing and partnership constellations with varying levels of status differences between the partners. With respect to the partner effects, the literature offers two theoretical explanations leading to opposite outcomes. The first explanation is based on New Home Economics (Becker, 1991) which can be considered an extension of human capital theory to family context. According to this approach, the partners pool their resources and make decisions in order to maximize the joint family utility. In particular, they decide how to allocate their time between paid market work and unpaid domestic work based on the comparison of a husband's and wife's marginal productivities in both areas. If a husband has a comparative advantage in labour market, then he will specialize in paid work, while his wife will specialize in domestic work. In other words, the higher is the social class and, thus, the earning potential of a husband, the less likely a wife will engage in employment. Thus, New Home Economics predicts a negative linear relationship between the husband's social class and the wife's labour supply. The studies conducted in several countries have shown that indeed a female partner's employment is lower when her husband's educational level, occupational status, or earnings are higher while controlling for the woman's own resources (Bernardi, 1999; Bernasco et al., 1998; Blossfeld et al., 2001; Verbakel & de Graaf, 2008, 2009).

In contrast to the New Home Economics, the second explanation based on social capital theory leads to the expectation of a positive relationship between husband's resources and woman's employment. In accordance with this approach, the partner's occupational position can be considered a form of social capital since it provides resources that can be used to facilitate labour market success (Lin et al., 1981). First, the husband can transmit his professional skills, competencies, experience, and even

knowledge on how to behave at a job interview to his wife. Secondly, a partner might stimulate his wife's labour market outcomes by transferring his positive attitude toward career advancement and motivating his partner to put effort into their professional growth. Thirdly, a partner can provide information about job openings and put his wife in contact with a potential employer. Finally, the husband might exploit his social networks to exert direct influence and facilitate his wife's employment. Although empirical evidence has not provided much support for the role of social capital for women's labour supply, studies have shown that social capital matters for occupational success among the employed. It has been found that the husband's social status has a positive impact on upward mobility chances (Robert & Bukodi, 2002; Verbakel & de Graaf, 2008), the probability of getting promoted to a top position (Bröckel et al., 2013), and on occupational prestige scores (Bernasco et al., 1998; Verbakel & de Graaf, 2009). Thus, it can be said that the economic and sociological theories apply to different aspects of female careers: the economic theory explains the labour supply, while the sociological theory accounts for the occupational outcomes (Bernardi, 1999).

It should be noted that partner effects might work unequally for women of different social standing. While previous studies have focused only on the combinations of partner's resources with a woman's own educational level (Bernardi, 1999) or ISEI (Vandecasteele & Esche, 2015), no research has considered the family background of a woman. Since both educational level and socioeconomic status are highly correlated with social origin, the expectation concerning the combinations of a woman's family background and her husband's own social class can be developed in the same direction as the existing literature. In particular, it might be expected that having a partner belonging to upper or middle social classes may provide a weak incentive to leave the labour market for women from advantaged family backgrounds. One reason for this prediction is that women from better-off families in general have a higher probability of being employed due to the mechanism reviewed in the previous section, as well as due to the higher likelihood of occupying better jobs and, thus, higher opportunity cost of not working. The second reason is that women who have grown up in advantaged families are more likely to develop gender-egalitarian attitudes and less traditional views on household division of labour (Kalmin & Kraaykamp, 2007). The key implication of this expectation is that there is a risk of cumulative advantage for women from better-off

social origins. The empirical evidence for Italy shows that the negative impact of the husband's resources on his wife's employment is present only in couples where a male partner has a comparative advantage compared to his wife, whereas for women occupying upper positions in social stratification, partner's resources do not disincentivise employment (Bernardi, 1999). Similarly, for Germany, the findings show that negative partner effect is largely neutralised for women in high-status homogamous partnerships (Vandecasteele & Esche, 2015).

Thus, the role of the partner's resources for women's employment should be examined in conjunction with their own resources expressed either through their occupational position, educational level, or family background. The previous empirical evidence suggests that husband's effect operates unevenly across different partnership constellations. While women in homogamous high-status couples have a rather low probability of leaving the labour force, women in homogamous low-status couples face the highest risk of becoming housewives (Vandecasteele & Esche, 2015). This implies the accumulation of inequality at the intersection of gender and social class/education/family background. Moreover, high-status women not only have greater chances of maintaining their employment but are also more likely to have a high-status partner that can provide them with additional support in terms of occupational attainment.

2. Mothers' employment in comparative perspective

2.1 The role of institutional and cultural contexts

On top of the individual-level factors, mothers' employment is affected by the institutional and cultural contexts expressed through family policies, labour markets, and norms regarding gender roles.

In terms of family policies, the studies on female employment usually focus on the role of maternity and father's/parental leave, as well as childcare provisions. Maternity leave policies are generally meant to support parental caregiving while guaranteeing employment protection and, in most countries, income security during this period. However, their impact on mothers' labour force attachment differs according to the length of the leave, and this relationship is found to be curvilinear.

Long or poorly compensated leaves hinder women's employment and undermine their opportunities in the labour market (e.g., Bainbridge et al., 2003; Pettit & Hook 2005; Boeckmann et al., 2015), leading to less secure, part-time positions afterward. By accentuating mothers' primary role as a caregiver, long leave reinforces the traditional gender norms (Budig et al., 2016) and employers' bias against women. This might result in lower chances of hiring or promotion for women with children and a greater likelihood of transferring them to part-time jobs or even dismissal upon the end of the job-protected period (Glass & Fodor 2011). Moreover, extended leaves are likely to result in skill deterioration and erosion of professional networks.

In contrast, short leave implies a minimal care role for mothers and presumes that they return to the labour market soon after childbirth. This might suggest reduced statistical discrimination and skills deterioration. However, empirical evidence shows that while short leave allows women with children to return to work sooner, many of them end up leaving the labour market entirely or getting jobs that enable them to reconcile family responsibilities (Keck & Saraceno, 2013). The reason for this is insufficient time for mothers to get ready to re-enter labour market after childbirth, especially when they are still expected to be the primary carer. As a result, short leaves might also lead to employers' statistical discrimination and restrict career choices for women as they enter the labour market.

Fathers' leave policy and, to some extent, parental leave, imply a dual-career family where fathers are actively involved in childcare. Its impact on mothers' employment might not be straightforward. On the one hand, father's leave may undermine existing gender norms and, as a result, reduce the statistical discrimination against women with children. The studies show that father's participation in childcare, especially in the early stages, often has a positive influence on women's continued employment and earnings (Andersen, 2018; Norman, 2020). On the other hand, in order for this positive impact to occur, the leave has to be sufficiently long for fathers to take part in childcare and change the perceptions around gender roles. With this regard, some countries (for instance, Sweden and Norway) have reserved certain periods of parental leave for fathers (the so-called "daddy quota") which disappear if they refuse to take it (Rønsen & Sundström, 2002). Furthermore, in countries where father's care role is not widely acknowledged, men may be stigmatized and even penalized at work for taking leave as they deviate from

the “masculine” “ideal worker” norm. This may lead to men’s lower take up of leave and, thus, not result in facilitating mothers’ employment.

Childcare provision may help mitigate work-family conflict, however, its impact on women’s active labour force participation depends on the availability of suitable job opportunities, as well as on whether the childcare service is private or public, full-time or part-time. Part-time childcare services might be incompatible with mothers’ normal working hours forcing them to opt for part-time work or exit the labour market completely. Furthermore, quality childcare might be costly and unaffordable for parents, making women leave employment or reduce working hours. However, if it is state-provided or subsidized, particularly for very young children (aged under three), it may positively affect mothers’ employment rates (Pettit & Hook, 2005, 2009). In addition, it has been shown that an increase in public childcare is particularly beneficial for low-educated mothers, and this positive effect is most pronounced at lower levels of childcare coverage, which highlights the importance of this policy measure for fighting social inequalities among households with young children (Scherer & Pavolini, 2023).

There is another aspect of public childcare provisions that might affect women’s employment opportunities. In countries with generous family policies, state-sponsored family services, such as childcare, elderly care, and educational institutions, operate within the public sector, providing attractive employment conditions for women, especially mothers (Mandel & Semyonov, 2005). The jobs in this sector are characterised by high protection, flexible working hours, and tolerance to absenteeism (Esping-Andersen, 1990; Kolberg, 1991). At the same time, while the extensive public sector enhances women’s employment chances, it also limits their earnings capacity and occupational attainment. That is, it reinforces the concentration of women in female-typed occupations offering convenient working conditions but restraining them from obtaining high-paying positions, therefore contributing to the widening of gender wage gaps (Mandel & Semyonov, 2005).

Besides family policies, the basis for the employment behaviour of women as mothers might be formed by the gender culture comprising the values, models, and belief systems concerning the gendered relationship of the family to employment and childcare (Pfau-Effinger, 2012). Motherhood penalties in terms of employment and earnings may be larger in countries with the dominant male breadwinner ideology. Similarly, gender

ideologies emphasizing mothers' care for children may result in lower rates of maternal employment. On the contrary, in countries where gender culture implies both men's and women's contribution to the household income, one may find smaller motherhood-based employment and earnings differences. However, it should be kept in mind that gender ideology and institutional measures are not independent, that is family policies are influenced and conditioned by cultural contexts and norms. This means that the association between gender culture and women's or maternal employment might simply reflect the impact of family policies. Indeed, cross-national comparative studies show that in countries with more egalitarian gender-role attitudes (where population supports a more equal division of household and paid labour between men and women), female labour supply is greater than in countries with less egalitarian attitudes (where the population holds that women should be involved more in household labour and less in paid labour than men), they provide no evidence on an independent effect of contextual culture net of institutional measures (e.g. Pettit & Hook, 2005; Steiber & Haas, 2009; Uunk & Lersch, 2019).

The institutional and cultural factors might unequally affect the employment opportunities of mothers from different family backgrounds. In countries with limited state support for female employment (i.e., lack of public childcare services, long and poorly compensated maternity leave, absence of father leave policies) and traditional gender norms, the role of parental resources, such as networks, financial support, might be particularly important for arranging childcare and maintaining labour force attachment. Moreover, advantaged family background might mitigate the employers' statistical discrimination against mothers based on negative perceptions of their productivity and commitment, which might be especially pronounced in countries with the dominant male breadwinner ideology and poor family policies.

2.2 Labour market structure and regulation

In addition to family policies and cultural context, maternal employment might be affected by the characteristics of the labour market, such as its structure and degree of flexibility, general unemployment rate, and availability of part-time jobs.

The empirical evidence shows that there is a negative association between unemployment and women's probability of being employed (e.g., Pettit & Hook, 2005;

Van Ham & Buchel, 2006). However, one needs to keep in mind that the mechanisms underlying the impact of unemployment on women's labour market participation are not straightforward. While high female unemployment is likely to dampen women's labour force participation, high rates of male unemployment may have the opposite impact (e.g. Jaumotte, 2004) making women compensate for their partner's unemployment ("added worker effect"). Furthermore, such "added worker effects" might occur in some (e.g. Germany) but not in other countries (e.g. the UK, where unemployment benefits are means-tested against family income) (McGinnity, 2004).

The lack of part-time opportunities is commonly expected to limit women in their employment options, i.e., more mothers would enter the labour force if such opportunities were widely available (e.g., Del Boca, 2002). Indeed, the availability of part-time work may allow women to combine employment with childcare thus encouraging some mothers to maintain labour market attachment instead of quitting their jobs. At the same time, part-time employment may also have a reverse effect on women's labour supply, making them work shorter hours. The existing evidence shows that the effect of part-time opportunities is not the same across the countries. The increase in part-time opportunities correlates positively with women's workforce participation only in countries where part-time jobs provide equivalent social protection and stability as full-time employment. In contrast, in contexts where part-time employment is linked to lower wages and poorer career prospects, it inevitably exacerbates labour market segmentation on a gender basis as well as a gendered division of paid and unpaid work, thereby bounding women to a role as secondary earners (Barbieri et al. 2019). It has been shown that the regional availability of part-time jobs fosters women's employment in Italy but not in France or the UK, where this type of work arrangement is likely to be of lower quality and highly penalized (Del Boca et al., 2009). Moreover, the diffusion of part-time work is particularly beneficial for women's active labour force participation in Continental/Conservative and even more so in the Mediterranean countries where the institutional and normative context supports the (modified) male breadwinner model and where the gender employment gap is accordingly high (Barbieri et al. 2019).

Furthermore, maternal employment might be affected by the country's labour market structure, in particular, by the size of the secondary segment. According to institutional economics, in advanced economies, the labour markets are characterised by non-

uniformity, namely by their segmentation into two sectors: capital-intensive or primary, and labour-intensive or secondary. Employees in the primary segment have stable, skilled jobs, requiring significant knowledge and experience, get high wages, good working conditions, and opportunities for promotion. Furthermore, the workers in this segment have considerable market power since they are protected by unions, and their wage contracts are generally covered by job security legislation, which makes the turnover costs high for the employers. In contrast, employees in the secondary sector get rather unstable and unskilled jobs characterised by low wages, bad working conditions, irregular working hours, and limited career prospects. They may be dismissed at any time with little or no cost to the employer due to their almost negligible market power and the fact that wages are often set through informal agreements.

The labour market dualism can be also considered through the lens of the insider-outsider theory (Lindbeck & Snower, 1988) which distinguishes three groups of workers depending on turnover costs: (1) the “insiders”, experienced incumbent employees, whose jobs are protected by high turnover costs; (2) the “entrants”, who have recently secured jobs with a future prospect of obtaining insider status, but whose current positions are not characterised by considerable turnover costs; and (3) the “outsiders”, who have no protection and are either unemployed or work in the informal sector, providing limited security. In the context of the dual labour market theory, incumbent employees in the primary sector represent ‘insiders’, while ‘outsiders’ are either unemployed or workers in the secondary sector. The empirical evidence shows that women are disproportionately overrepresented in outsider jobs (e.g., Esping-Andersen, 1999; Schwander and Häusermann, 2013). In contrast to men, women are more likely to work part-time (especially mothers) and have temporary jobs or career interruptions. In addition, they are more likely to hold low-income jobs with few career prospects, even in the case of full-time or standard employment contracts (ILO, 2019).

On the one hand, disadvantaged groups, such as mothers, have higher probabilities of securing employment in the secondary labour market, which is less constrained by institutional regulations and where occupational experience and other human capital characteristics matter very little. Therefore, in countries with a relatively larger secondary segment and a stronger demand for unskilled or low-skilled labour, women with children should have on average fewer difficulties in getting a job. This means that the motherhood

employment penalty should be lower. On the other hand, the jobs in the secondary segment are highly unstable and characterised by frequent and extended unemployment spells (Vishwanath, 1989; Blanchard & Diamond, 1994). Moreover, the “outsiders” have limited access to generalised or specific on-the-job training which makes it difficult to enhance one’s human capital and compete for new positions. This suggests high unemployment rates among vulnerable groups and a lack of mobility between primary and secondary segments, leading to a permanent attachment to the outsiders’ sector.

The flexibility of a labour market in a certain country is determined by the extent of its regulation which might affect employment chances, particularly among individuals in vulnerable groups. A key element of labour market regulation is Employment Protection Legislation (EPL) which comprises policies concerning hiring and firing and constraints on employers’ rights to terminate at will or to use short-term, contingent, or temporary (i.e., precarious) hiring contracts. In countries with a more stringent EPL, where dismissal costs are high, employers make hiring decisions based on a scrupulous screening rather than on a trial-and-error approach. Given the uncertainty about an applicant’s actual productivity, employers seeking to mitigate the risk of a bad match pay attention not only to observable and clear signals of appropriate skills (such as educational credentials and experience) but also to ascriptive characteristics, such as gender or immigrant status (Kogan, 2007). This results in a higher probability of statistical or error discrimination practices and activation of stereotypes among employers. Thus, under the constraints of the strict EPL, firms might be less likely to hire mothers compared to men or childless women, which might further amplify the divide between outsiders and insiders.

Since EPL concerns mainly the primary segment, employers in the secondary segment are less likely to scrutinize ascriptive characteristics and more likely to test employees’ characteristics on the job, even in countries with overall strict labour market regulation. The reason is that the hiring process operates according to profit-maximisation principles and the costs of a bad match are relatively low. This means that mothers should have a lower unemployment disadvantage in countries with stronger demand for unskilled or low-skilled, secondary labour market jobs, even when the EPL is stringent. On the contrary, in countries with strict EPL and limited secondary segments, women with children are expected to have lower chances of entering the labour force. However, as it was mentioned previously, it should be kept in mind that secondary labour market jobs

are generally temporary and more unstable, being susceptible to business cycle fluctuations and economic restructuring.

The impact of labour market characteristics on mothers' employment probabilities might differ among women from better-off families and those from less privileged backgrounds. In rigid labour markets, where dismissal costs are high and employers tend to make hiring decisions based on a scrupulous screening, taking into account the ascriptive characteristics of the candidates (such as parenthood status and gender), mothers from less privileged families might be particularly disadvantaged compared to their counterparts from better-off families, facing a double penalization. Moreover, limited secondary segment and scant part-time jobs might further restrict the employment chances of mothers with disadvantaged social origins, not having an opportunity to rely on parental networks and financial resources.

2.3 Welfare regimes as the basis for comparative analysis

The studies addressing the cross-country differences in female/maternal labour market supply usually adopt a typology of welfare regimes proposed by Esping-Andersen (1990) which is based on country differences in labour markets and their regulation, as well as welfare provisions. According to this typology, three models of the welfare state are distinguished: social-democratic, liberal, and conservative-corporatist. Although the three welfare regimes do not exist in pure form, representing ideal types or approximations of the most prevailing characteristics within a cluster of countries, the proposed typology provides an important interpretative framework for comparative analysis.

According to Esping-Andersen (1990), the key targets of welfare state intervention, class, and gender stratification, are tackled by decommodification and defamilialization. The former is accomplished through substitutes for wages, either directly by means of income transfers or indirectly by providing free or subsidized goods and services (e.g., free education and health services, insurance against sickness, and public housing). The latter is realized through care services that support the reconciliation of women's paid work and household responsibilities. Moreover, the decommodification of health and education services, or defamilialization of child and elder care, results in the third function, that is, the welfare state as employer, providing jobs for women and labour-

force entrants (Esping-Andersen, 1990). The three roles influence the cross-country differences in female labour market outcomes.

The social-democratic regime, encompassing Scandinavian countries (Sweden, Denmark, Norway, Finland), represents all three welfare state roles with a high level of decommodification, defamilialization, and a large public sector of employment (Mandel & Shalev, 2009). It is based on the principles of egalitarianism, encouraging equality across classes, and universalism, ensuring full responsibility of the state for guaranteeing the welfare of its citizens regardless of market forces in general and the citizens' own market activity in particular. The labour market is generally quite flexible providing many low-skilled service jobs in the public sector, although not in the private sector (Esping-Andersen, 1999). In general, weak economic incentives may result in long-term unemployment and welfare dependency.

Given the principle of egalitarianism, the social-democratic regime is committed to enhancing gender equality in several ways. First, state-subsidized child-care services facilitate female employment. The universalistic approach to this measure leads to the integration of less committed workers into the labor market, which partially explains a higher concentration of women in the public sector and female-dominated occupations (Hansen, 1995). Second, monetary remunerations for childcare (in the form of paid maternity and paternity leaves, child allowances, and tax relief for children) improve women's economic position and support their economic independence. Third, part-time employment guarantees continuous engagement of mothers in the labor force. It is offered as a temporary stage during early childrearing, with a further transition to full-time employment. Consequently, it is not perceived by employers as a signal of lower commitment. Moreover, part-time work is characterised by conditions similar to full-time employment, including employment benefits, union protection, and access to good jobs. With this regard, one would expect relatively higher rates of employment and its continuity for mothers in countries with a social-democratic welfare regime.

The liberal regime, comprising English-speaking countries (e.g., the USA, Australia, the UK), is the opposite of the social-democratic regime as it implies the primacy of the market in providing social and family services. State intervention occurs only when the market fails. The social programs are designated mainly for the working class and the poor and means-tested assistance is prevalent. The regime is characterised by high labour

market flexibility and weak, decentralised industrial relations. Theoretically, it should result in more jobs for the low-skilled and prevention of long-term unemployment (Andersen & Halvorsen, 2002). At the same time, the liberal regime is also associated with large wage disparities and much poverty.

The division of household responsibilities in liberal welfare countries is determined by the market. Men, having better labour market positions and being free of childcare duties (both normatively and practically), are expected to devote most of their time to work. Women are limited in their time allocation decisions and are forced to weigh the costs and benefits of paid work against household responsibilities. Poor public childcare provisions and usually short and poorly compensated parental leaves make work-family reconciliation problematic. Part-time employment is mainly found in a limited number of occupations and dead-end, temporary jobs with scarce career prospects (Stier et al., 2001). Moreover, it is typically considered by employers as a signal of lower commitment to work compared to full-time employment (Kishler & Alexander, 1987). As a consequence, countries with a liberal welfare regime are usually characterised by a strong selection of mothers into labour market based on expected rewards and their orientation toward work (Blakemore & Drake, 1996; Hansen, 1995). Those who have lower earnings and higher costs of childcare are likely to experience employment interruptions, whereas those who can “afford” childcare are likely to continue their employment.

In conservative-corporatist welfare regime (e.g., Germany, France, Austria, Italy, Spain), the state rather than the market is likely to be responsible for providing welfare. At the same time, it does not promote redistribution or equalisation, keeping the existing class and status differentials. The regime is characterised by highly segregated, segmented, and rigid labour markets with substantial labour costs, rather compressed wage structures, employment-based social insurance, and, as a consequence, strong insider-outsider divisions (Kogan, 2007).

The conservative-corporatist regime promotes a traditional division of household responsibilities, both normatively and institutionally, with no attempt to enhance gender equality. Men are considered breadwinners and granted strong job protection. A high degree of defamilialization implies that childcare is mainly provided by women. Family policies, including the tax regime and undeveloped public childcare facilities, foster women’s withdrawal from (or limit their involvement in) labour market, especially when

they have young children (Stier et al., 2001). Part-time employment is viewed as a form of female labour market integration. Given the main role of women as caregivers and housewives, part-time jobs are likely to be found in female-type, secondary sectors of employment. At the same time, they are characterised by employment benefits and union protection similar to full-time jobs. Therefore, due to the dominance of traditional gender norms and poor labour market opportunities, especially for young mothers, one would expect a high likelihood of unemployment and work interruptions among women with children in countries with a conservative-corporatist welfare regime. Moreover, because of the concentration of mothers in secondary jobs with relatively low wages, intermittent employment may not be costly to women.

The post-socialist countries of Central and Eastern Europe are usually analysed as a separate specific group. Women's employment patterns have been historically different in these countries compared to Western Europe. As a consequence of the socialist emphasis on maximum utilization of labour force potential, female employment rates in Eastern Europe in the period from the 1960s until the political turnover in 1989 were much higher than in Western Europe. Under the "dual earner-female double burden model", women were supposed to contribute to the household budget and, at the same time, be the main care providers for their families. This model was encouraged by generous social policies, job guarantees, and low competition in the labour market. The breakdown of socialism brought changes in the labour market structure, as well as the reduction in public support for families, both in terms of income and provision of services. At the same time, the female dual burden persisted, resulting in greater difficulty in reconciling work and family responsibilities. Despite this challenge, mothers in Central and Eastern Europe still tend to return to full-time employment relatively quickly after childbearing (Matysiak, 2011). As for the labour markets in general, they were extremely rigid during the socialist era, with administrative assignment and life-long job security, restricted dismissals, as well as uniform job classifications and wage scales set at the national level (Cook, 2010). Since 1990, however, the Central and Eastern European countries have adopted legislation that made the labour markets more flexible.

3. Research questions and hypotheses

While several studies have analysed the heterogeneity of maternal employment by educational level, no research has been done with respect to the impact of social class of origin on a mother's occupation. The importance of considering family background can be explained by two reasons. First, even though there is a strong positive association between one's education and social class of origin, family background influences one's occupational outcomes over and above the educational level. In other words, education does not explain the total impact of social origin. Second, the direct effect of social origin might add up to the effect of motherhood resulting in a cumulative disadvantage or compensate for the negative impact of childbearing on women's employment chances. That is, on the one hand, women with children coming from disadvantaged backgrounds might be particularly penalized in terms of their employment opportunities. On the other hand, mothers from better-off families might be more likely employed thanks to the DESO mechanisms at work, such as, for instance, direct inheritance of the family business, financial support for starting their own entrepreneurial activities, getting a job thanks to parental social networks, higher motivations to return to paid work after childbearing, as well as a lower likelihood of being discriminated by employers. Thus, the first research question of the study and the relative hypothesis can be formulated as follows:

RQ1: Do mothers with advantaged social origin have higher chances of being employed compared to mothers with less privileged backgrounds, net of the educational level?

H1: Mothers with advantaged social origin have higher chances of being employed compared to mothers with less privileged backgrounds, net of the educational level.

Furthermore, the DESO might interact with the number of children in the family. On the one hand, the higher the number of children, the greater the burden of household responsibilities, which makes the resources of the family of origin particularly important for work-family reconciliation and for mitigating the negative perceptions of employers regarding the mothers' productivity. On the other hand, the higher number of children might be associated with the higher economic necessity of being employed, especially for women from disadvantaged backgrounds. Thus, the second research question can be formulated as follows:

RQ2: Does the DESO on the employment probability of mothers change according to the number of children?

The theoretical expectations regarding this question are not straightforward, thus no hypothesis is developed.

The impact of social class of origin on a mother's employment might also vary depending on her husband's own social class. While previous studies have focused only on the combinations of a partner's resources with a woman's own educational level (Bernardi, 1999) or ISEI (Vandecasteele & Esche, 2015), no research has considered the family background of a woman. As specified in section 1.2, the impact of a partner's resources can be explained based on the New Home Economics (Becker, 1991) or social capital theory. The empirical evidence shows that the former applies to the labour supply, while the latter accounts for the occupational outcomes (Bernardi, 1999). Although the New Home Economics predicts a negative relationship between the husband's social class and the wife's labour supply, the effect might not be the same for mothers from different family backgrounds. There are at least two reasons to expect that having a partner belonging to upper or middle social classes may provide a weak incentive to leave the labour market for women from advantaged family backgrounds. First, women from better-off families in general have a higher probability of being employed as well as a higher likelihood of occupying better jobs and, thus, a higher opportunity cost for not working. Second, women who have grown up in advantaged families are more likely to develop gender-egalitarian attitudes and less traditional views on household division of labour (Kalmin & Kraaykamp, 2007). Therefore, the effect of the husband's resources might lead to a risk of cumulative advantage for women from better-off social origins. With this regard, the third research question and the relative hypothesis can be formulated as follows:

RQ3: Does the impact of the partner's higher social standing result in a cumulative advantage for mothers from upper and middle social classes of origin?

H3: A higher social class of partner disincentivises the employment of mothers from disadvantaged families but has no effect on employment probabilities of mothers from advantaged social origins.

In addition, the study also poses the following question:

RQ4: Does the impact of the partner's social class of origin on employment probabilities of mothers from different social origins vary according to the number of children in the family?

In addition to individual-level factors, the employment of mothers is determined by the macro context characterised by the country's family policies, gender norms, and labour market structure and regulations. Although there is a large number of studies that investigate cross-country differences in women's employment (e.g., Pfau-Effinger, 2012; Stier et al, 2001; Fortin, 2005), as well as the studies that model female labour supply based on micro-data in single countries, limited attention has been paid to the variation in the impact of individual factors by national contexts. Therefore, the fifth research question of this study is set in the following way:

RQ5: How does the DESO on employment probabilities of mothers differ across the countries?

In this study, the comparisons are made between eleven countries belonging to different welfare regimes and having different labour market structures and regulations: Sweden, Denmark, Czech Republic, Poland Germany, Austria, Switzerland, France, Italy, Spain, and Greece.

First, the differences in motherhood employment penalties among women from advantaged and disadvantaged origins might be particularly pronounced in countries with low state support for female employment (such as poor public provision of childcare, limited part-time opportunities, long and poorly paid maternity leaves) and strong traditional gender-role attitudes. The parental resources might provide additional support in terms of arranging private childcare services. Moreover, the advantaged background might mitigate the employers' statistical discrimination against mothers based on negative perceptions of their productivity and commitment, which might be particularly strong in the countries with the above-mentioned characteristics. Second, as discussed in section 2.2, the differences in motherhood employment penalties among women from advantaged and disadvantaged origins might be relatively larger in the countries with strict EPL and limited secondary segment. In rigid labour markets, where dismissal costs are high, employers make hiring decisions based on a scrupulous screening, taking into account the ascriptive characteristics of the candidates (such as parenthood status and gender). This results in a higher probability of statistical or error discrimination practices

and activation of stereotypes against mothers. However, as mentioned above, the advantaged social origin might offset the negative perceptions about the productivity and commitment of mothers. Since EPL concerns mainly the primary segment, the larger the secondary segment the more alternative employment chances (although of a low quality) are available for women, especially for those who are coming from disadvantaged families. Employers in the secondary segment are less likely to scrutinize ascriptive characteristics and more likely to test the workers' characteristics on the job, even in countries with overall strict labour market regulation.

Based on these considerations, it is expected that in Sweden and Denmark, the countries belonging to social-democratic welfare regime and characterised by high labour market flexibility, the motherhood employment penalty, as well as the differences in its magnitude among women from upper/middle and lower social classes of origin, will be the smallest. Both countries provide extensive public childcare services, and short-paid parental leave schemes, limiting skill attrition whilst allowing mothers to keep their position in the labour market. Moreover, both countries are characterised by open and egalitarian mobility opportunities, expanded public service sector employment, limited demand for unskilled and low-skilled jobs, and quality part-time jobs. These contextual factors suggest the availability of employment opportunities, especially for mothers of lower socioeconomic backgrounds, and less likelihood of employer's discrimination practices.

On the other hand, it is expected that the motherhood disadvantage of women from lower social classes compared to women from better-off families will be the largest in several countries belonging to conservative-corporatist welfare regime, such as Germany, France, and Austria. These three countries are characterised by rigid labour markets with substantial labour costs, which implies that employers' hiring decisions are likely to be affected by ascriptive characteristics, such as social class of origin. Moreover, undeveloped public childcare facilities together with strong traditional attitudes toward gender roles, foster women's withdrawal from (or limit their involvement in) labour market, especially when they have young children, and consequently fuel employers' stereotypes about productivity and commitment of mothers. At the same time, the advantaged family background might eliminate or limit employers' negative perceptions since women from service- or middle-class families might demonstrate increased career

motivations and have better financial opportunities for affording private childcare services.

Despite the fact that Southern-European countries (Italy, Spain, Greece) have even more rigid labour markets compared to Germany, France, and Austria, the differences in motherhood penalties between the two groups of women are expected to be relatively lower due to the presence of large secondary segment not subject to strict regulations and thus providing easy access to employment. The existence of an extensive secondary segment in Southern Europe is related to unsatisfied demand for low-skilled labour, as a result of weak welfare systems and the lack of public care services. In addition, these countries are characterised by the prevalence of small and micro firms for which labour regulation either is looser or it is only partially or not all enforced. Therefore, the hypothesis related to the fifth research question can be outlined as follows:

H5: The differences in motherhood employment penalties among women from advantaged and disadvantaged origins are the smallest in Sweden and Denmark, while in Germany, Austria, and France the gaps between the two groups are the largest.

4. Data, variables, and methods

The study is based on SHARELIFE data, a retrospective survey focusing on people's life histories including all the important areas of respondents' lives, ranging from partners and children to housing and work history to detailed questions on health and health care. The two waves (w. 3, release 7.0.0, and w. 7, release 7.0.0) were merged and harmonized, women were linked to their partners. The analytical sample is based on the selection of women of 25-55 years who had at least one episode of employment and includes eleven countries: Sweden, Denmark, Czech Republic, Poland Germany, Austria, Switzerland, France, Italy, Spain, Greece. The sample covers the years from 1955 to 2017 and four cohorts: 1930s, 1940s, 1950s, and 1960s. The observations with missing cases on independent and control variables introduced below were excluded, which yielded an analytical sample of 326,443 observations from 10,758 women.

Since there might be problems of selection, employment can be considered sufficient for studying labour market penalization of mothers (for instance, in Italy employment of women, especially mothers, is concentrated among high earners, therefore mothers with low income are not represented in the sample simply because they do not work). Thus,

the dependent variable in this study is a dummy for being employed. The independent variables are (contingent on a specific model) the number of children (0 – no children, 1 – one child, 2 – two or more children) or a children dummy.

Fixed-effects (FE) models were used to answer the research questions as they allow to solve the problem of unobserved heterogeneity and obtain unbiased estimates under the assumption that the unobserved characteristics and their effect on the outcome of interest are time-invariant. In the first step, FE models were estimated separately for two categories of a woman’s social class of origin (1 - middle or service class, 2 - working class) operationalized through a dominance principle:

$$(Y_{it} - \bar{Y}_l) = \beta(X_{it} - \bar{X}_l) + (\alpha_i - \bar{\alpha}_l) + (\varepsilon_{it} - \bar{\varepsilon}_l) \quad (9),$$

where X_{it} is the vector of time-varying regressors (age squared, year, region of residence, civil status (0 – single, 1 – engaged, 2 – married, 3 – divorced) and number of children), ε_{it} is a time-varying error term (idiosyncratic error term), α_i is a person-specific time-constant error term. Since demeaning wipes out person-specific time-constant unobserved heterogeneity, $(\alpha_i - \bar{\alpha}_l) = 0$.

In the second step, FE models with interaction terms between the number of children and partner’s social class (1 - Service/Middle, 2 - Working, 3 - single/divorced/or widowed women) were estimated separately for two categories of a woman’s social class of origin. The models controlled for age squared, year, and region of residence. In the third step, fixed-effects models were estimated separately for 22 groups of women depending on their social class of origin and country of residence. The independent variable in these models was children dummy, while control variables were age squared, year, region of residence, and civil status.

5. Results

Figure 12 shows the results with respect to relative employment probabilities obtained from the FE models estimated separately for two categories of a woman’s social class of

origin⁴. Compared to childless women, mothers are penalized in terms of their employment probability and this disadvantage increases with the number of children, irrespective of the social class of origin. However, women coming from service and middle social classes face lower penalties in contrast to women of working-class origin. This means that even under the condition of equal levels of education, mothers from disadvantaged backgrounds fare worse than their counterparts from middle- or upper-class families.

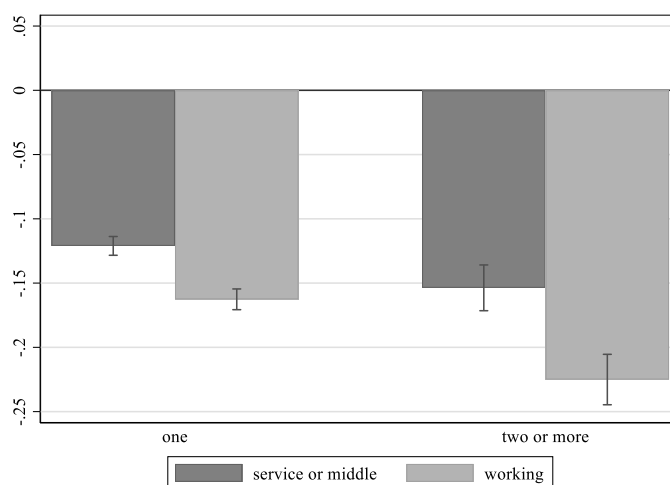


Figure 12 - Employment probability (ref. childless women) by social class of origin.

Moreover, the direct effect of the social class of origin together with the number of children creates a cumulative disadvantage. The transition from a one-child family to a family with two or more children is associated with a 0.03 p.p. decrease in the relative employment probability of women with better-off origins, while for women from working-class backgrounds, the relative employment propensity falls by 0.06 p.p. Therefore, the results confirm hypothesis 1, claiming that mothers with advantaged social origin have higher chances of being employed compared to mothers with less privileged backgrounds, net of the educational level. This means that motherhood status combined with the direct effect of social origin generates a cumulative disadvantage, the mechanisms of which might be related to the direct inheritance of the family business, financial support for starting own entrepreneurial activities, getting a job thanks to parental social networks, higher motivations to return to paid work after childbearing, as

⁴ Full table (A11) is provided in the Appendix to Chapter 4

well as a lower likelihood of being discriminated by employers. In addition, the cumulative disadvantage for mothers from lower-class families is further amplified by the impact of the number of children in the family. This might suggest that the increased burden of household responsibilities associated with a higher number of children makes the resources of the family of origin particularly important for work-family reconciliation and for mitigating the negative perceptions of employers regarding the mothers' productivity. The data used in this study, however, do not allow testing of the possible mechanisms behind the outcomes revealed. Future studies might tackle this issue by implementing experimental research designs.

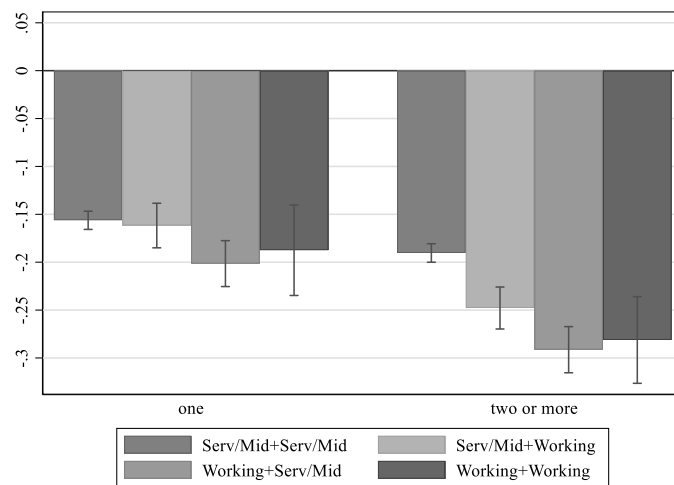


Figure 13 - Employment probability (ref. childless women) by a woman's social class of origin and her partner's own social class.

In the following step of the analysis, the social class of a woman's partner was introduced in the model in order to investigate whether a husband's high social status might compensate for the disadvantage of women with working-class backgrounds or further boost the advantage of women from service and middle social classes of origin. Figure 13 shows the results from the FE models with interaction terms between the number of children and partner's social class estimated separately for two categories of a woman's social class of origin⁵. For mothers with one child, a partner's social standing makes no difference in their employment propensities, irrespective of their own family background. In contrast, in families with two or more children, a partner's higher social

⁵ Full table (A12) is provided in the Appendix to Chapter 4

standing provides a substantial advantage for women from middle or upper social classes of origin, while it does not attenuate the motherhood penalty for women from less privileged backgrounds. Thus, the impact of the partner's social class on the magnitude of the motherhood penalty of women from different social classes of origin is limited to families with two or more children. Moreover, in contrast to the expectations (H3), it is found that the partner's social class has no impact on employment of women from disadvantaged families, while it counts for women with two or more children from better-off families. Therefore, the role of the partner's social class has a limited impact on the employment probability of mothers and does not eliminate or substantially moderate the direct effect of social origins.

To analyse whether the direct effect of social origin on motherhood employment penalties varies across national contexts, the FE models were estimated separately for 22 groups of women depending on their social class of origin and country of residence. The results are reported in Figure 14 and Figure 15⁶. The former shows the motherhood employment penalties for women of different family backgrounds, while the latter displays average predicted probabilities of employment for women with or without children coming from different social classes.

Germany, Austria, and Switzerland show the largest motherhood penalties for women, irrespective of their social origins. Moreover, these countries also display substantial differences in motherhood employment gaps among women from different family backgrounds: 12 p.p., 10 p.p., and 13 p.p., respectively. These outcomes might be related to the rigidity of labour markets (in Germany and Austria), traditional or modernized male breadwinner model along with a familialistic care regime. Although, in terms of gender regime Switzerland, like Germany and Austria, belongs to a conservative cluster, the labour market regulation in this country is much less rigid. In particular, Switzerland is characterised by weak employment protection, low collective bargaining coverage, and the absence of a legal minimum wage (Murphy & Oesch, 2018). The combination of market-liberal institutions, low rates of unemployment, and intense work migration results in a highly competitive labour market.

⁶ Full tables (A13-A16) are provided in the Appendix to Chapter 4

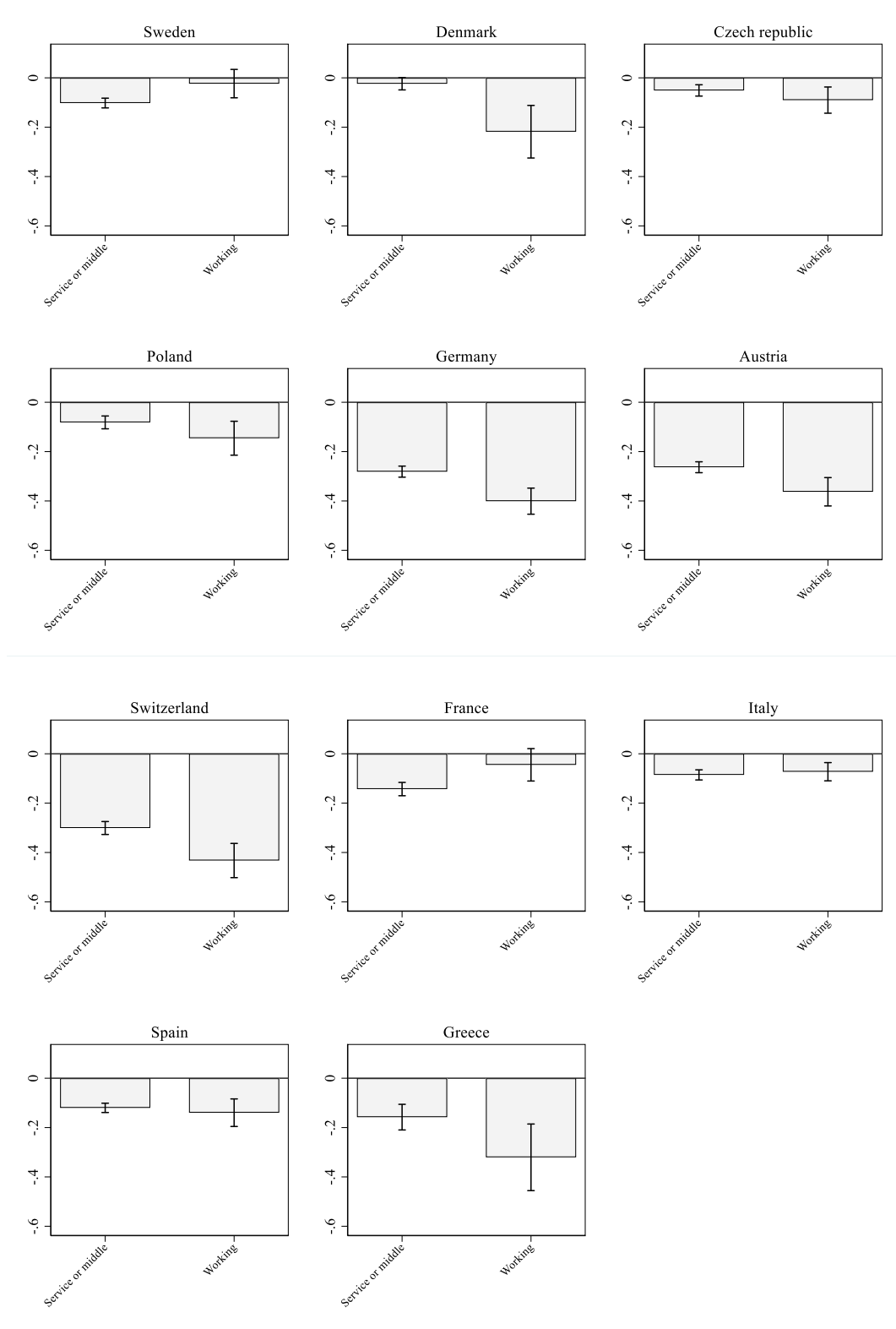


Figure 14 - Employment probability (ref. childless women) by social class of origin and country.

Moreover, the Swiss occupational structure is strongly sex-segregated with substantial mobility barriers between the segments: access to a specific segment depends on holding the appropriate occupation-specific certificate (Buchmann et al, 2010). Expensive childcare, together with strong competitiveness and segmentation of the labour market might explain the substantial DESO found for mother's employment in Switzerland. Such a national context might result in the activation of stereotypes against mothers' labour market performance, as well as discrimination based on ascriptive characteristics.

As expected, although Southern-European countries (Italy and Spain) are characterised by the highly segmented labour market, where strong rigidity is associated with large informal flexibility, the gaps in motherhood employment penalties between women from the upper classes and women coming from disadvantaged backgrounds in these national contexts are almost non-existent and not statistically significant. On the one hand, this outcome might be explained by the existence of a large secondary segment not subject to strict regulations and thus providing easy access to employment. On the other hand, this result might be related to the fact that, in general, Southern-European countries, characterised by the prevalence of the male breadwinner model and limited formal caring services, show the lowest female employment rates in Europe, which can also be seen from Figure 15, so that DESO makes almost no difference for motherhood penalties. The exception in the group of Southern-European countries is Greece, for which there is a substantial difference (16 p.p.) in motherhood employment penalty between the two groups of women. However, this result should be treated with caution due to the high uncertainty of the estimates for women from working-class families resulting from the limited number of observations.

The results, similar to Italy and Spain, are the Czech Republic, although the latter country shows, on average, relatively higher employment rates for women of both social origin groups. As for Poland, although it shares the same labour market characteristics, gender ideology, and family policies as the Czech Republic, the results show a slightly larger relative disadvantage in terms of employment probability for women of working-class social origin in this country (6 p.p.).

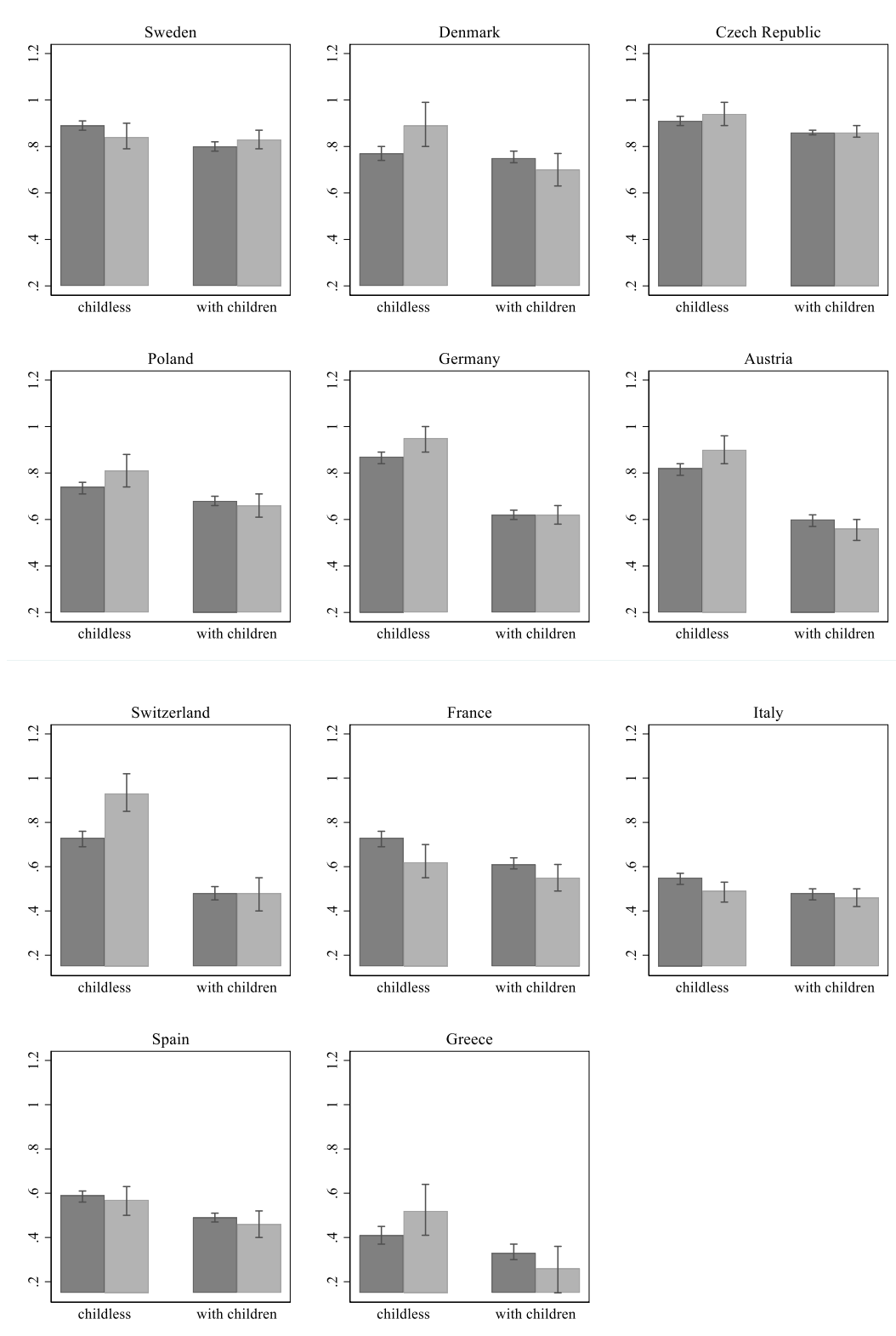


Figure 15 - Average predicted employment probabilities by social class of origin (dark bars – service and middle social class of origin, grey bars – working class of origin) and country.

Since both countries are characterised by highly rigid labour markets (at least till the start of the transitional period), absence of part-time work opportunities for women, and emphasis on mothers' responsibility for childcare, one would expect similarly substantial DESO on motherhood employment penalties. At the same time, the results for the Czech Republic and Poland should be treated with caution since the labour markets in these countries experienced substantial changes in the period of transition. Thus, further analysis should deepen the understanding of country-specific mechanisms underlying the impact of family background on motherhood employment gaps.

The outcomes for Sweden confirm the expectations of limited differences in motherhood penalties among women from different family backgrounds, while Denmark does not fit the hypothesis. However, the estimate for working-class women in the latter country is highly uncertain due to the limited number of observations.

6. Conclusions

This study has focused on the interplay between the family-of-origin (social class of origin) and the family-of-destination (motherhood, partner's resources) factors in shaping women's employment outcomes. Starting one's own family and moving to parenthood is a major life course event and one of the key factors leading to the differences in workforce participation and wages between men and women (gender gap), as well as between mothers and non-mothers (motherhood penalty). Although several studies have examined the role of education for women's employment, there is no evidence on how social origin, net of educational achievement, might impact the labour market outcomes associated with motherhood. The importance of addressing this question is related to the fact that DESO might create a cumulative disadvantage for mothers from less privileged backgrounds or compensate for the motherhood penalty for women from better-off origins.

The results of this study showed that mothers with advantaged social origins had higher chances of being employed compared to mothers with less privileged backgrounds, net of the educational level. Although the data used in this study did not allow to analyse the underlying mechanisms, it might be hypothesized that such outcome is related to the direct inheritance of the family business, financial support for starting own entrepreneurial activities, getting a job thanks to parental social networks, higher motivations to return to paid work after childbearing, as well as a lower likelihood of

being discriminated by employers. It should also be noted that the cumulative disadvantage for mothers from lower-class families was further amplified by the impact of the number of children in the family. This might suggest that the increased burden of household and care responsibilities associated with a higher number of children makes the resources of the family of origin particularly important for work-family reconciliation and for mitigating the negative perceptions of employers regarding the mothers' productivity.

Further, the study examined whether there was an interaction between the resources of the family of origin and the partner's resources in shaping the mothers' employment chances. Contrary to the expectations, it was found that the partner's social standing had no effect on the workforce participation of mothers from disadvantaged families. At the same time, a partner's higher social class partially mitigated the motherhood employment penalty for women from better-off origins, although this impact was limited to families with two or more children.

In the final step, the study focused on cross-country comparisons of DESO on motherhood. In accordance with the theoretical expectations, it was found that the employment disadvantage of mothers from working-class families compared to mothers from middle- or upper-class families was relatively larger in Germany, Austria, and Switzerland. These countries are characterised by low state support for female employment (in particular, poor public provision of childcare) and traditional gender-role attitudes, which might facilitate employers' negative perceptions regarding the productivity and commitment of mothers. At the same time these discrimination practices might be counterbalanced by more favourable attitudes towards women from better-off families. Moreover, family resources might be particularly important for arranging private childcare services. In addition, Germany and Austria are countries with rigid labour markets, which means that the dismissal costs are high and employers are likely to make hiring decisions based on a scrupulous screening, taking into account the ascriptive characteristics of the candidates (such as parenthood status, gender, and social origin). Although, in terms of state regulation, the labour market in Switzerland is more liberal, its highly competitive and segmented nature may also reinforce employers' discriminatory practices based on ascriptive characteristics.

Relatively lower differences in motherhood penalties between the women from better-off origins and those from less privileged families were found in Sweden and Southern European countries (Italy, Spain). For Sweden, this outcome might be explained by extensive public support for childcare, open and egalitarian mobility opportunities, and as a result more employment opportunities for mothers and less likelihood of employers' discrimination based on parenthood status, gender, and social origin. On the other hand, for Spain and Italy, countries with highly rigid labour markets and poor public support for childcare, a relatively lower DESO on motherhood penalty might be related to the existence of a large secondary segment not subject to strict regulations and thus providing easy access to employment, especially for mothers from less privileged origins. An alternative explanation might be derived from the fact that these countries show, on average, the lowest female employment rates in Europe, so that DESO makes almost no difference for motherhood penalties.

To conclude, this study confirmed the existence of DESO on employment opportunities of women with children, resulting in a cumulative disadvantage for mothers from less privileged family backgrounds. This effect is further amplified by the number of children in a family, whereas the role of the partner's resources in the interplay with a woman's social origin is limited. A partner's own social standing is found to compensate for the motherhood employment penalty only among women from better-off families having two or more children. Furthermore, a country comparative analysis showed that DESO on motherhood employment penalties operates differently across various national contexts. It appears that relatively larger differences in motherhood penalties among mothers from less privileged backgrounds and those from better-off origins are likely to be found in countries with limited support for female workforce participation, traditional gender role attitudes, as well as highly rigid labour markets, and limited or non-existent secondary segment. In contrast, lower DESO on motherhood employment penalties is likely to occur in contexts with extensive public childcare services, egalitarian gender role attitudes, and flexible labour markets with open mobility patterns. At the same time, DESO seems to be also less pronounced in Southern European countries characterised by very low female employment rates.

It should be noted that the study has important limitations that call for further research on the role of DESO for female employment opportunities. First, the study did not analyse

the mechanisms underlying the impact of social origin on the magnitude of the motherhood employment penalty. Second, the data used in this study did not allow the author to include the effect of partner's resources in the analysis of cross-country differences. Third, European countries exhibit substantial regional differences in family policies and labour market characteristics, suggesting that the aggregate national results might be inaccurate when it comes to assessing the role of institutional factors for motherhood penalties. Finally, future studies might enrich the research on mothers' labour market outcomes by analysing the effect of social origin on the motherhood wage penalty and occupational outcomes, as well as how this effect operates around childbirth and over time. With this regard, particular attention could be paid to a woman's pre-birth occupational characteristics, as recent research shows that the lack of flexibility, especially relevant for blue-collar and service occupations, might push mothers out of the labour force. Women employed in occupations characterised by a higher incidence of 40-plus-hour workweeks and a larger wage premium to longer work hours are found to be less likely to remain employed after childbirth compared to women in occupations where longer workweeks are less common, and the wage premiums for extended work hours are smaller (Ishizuka & Musick, 2021).

Appendix

Table A11 – Heterogeneity of motherhood employment penalties by social class of origin. Results from fixed-effect models.

VARIABLES	Service or middle	Working
Number of children (ref. No children)		
One	-0.12*** (-0.13 - -0.11)	-0.15*** (-0.17 - -0.14)
Two or more	-0.16*** (-0.17 - -0.15)	-0.23*** (-0.24 - -0.21)
Civil status (ref. Single)		
Engaged	-0.04*** (-0.05 - -0.03)	-0.07*** (-0.10 - -0.04)
Married	-0.10*** (-0.11 - -0.08)	-0.11*** (-0.14 - -0.08)
Divorced	-0.04*** (-0.05 - -0.03)	-0.08*** (-0.11 - -0.05)
Age	0.05*** (0.05 - 0.05)	0.05*** (0.04 - 0.05)
Age#age	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)
Constant	-0.07 (-0.17 - 0.03)	0.20** (0.02 - 0.39)
Observations	268,289	58,154
Number of id	8,841	1,917

Confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for region and year

Table A12 – Heterogeneity of motherhood employment penalties by social class of origin. Results from fixed-effect models with interaction terms between the number of children and partner’s social class.

VARIABLES	Service or middle	Working
Number of children (ref. No children)		
One	-0.16*** (-0.17 - -0.15)	-0.20*** (-0.23 - -0.18)
Two or more	-0.19*** (-0.20 - -0.18)	-0.29*** (-0.32 - -0.27)
Partner's social class (ref. Service or middle)		
Working	0.05*** (0.03 - 0.07)	0.04 (-0.01 - 0.08)
Single/divorced/or widowed women	-0.06*** (-0.07 - -0.05)	-0.15*** (-0.18 - -0.12)
Interaction between partner's social class and number of children		
One child#Working	-0.01 (-0.03 - 0.02)	0.01 (-0.04 - 0.07)
One child#Single/divorced/or widowed women	0.01 (-0.00 - 0.02)	0.05*** (0.02 - 0.08)
Two or more children#Service or middle	0.00 (0.00 - 0.00)	0.00 (0.00 - 0.00)
Two or more children#Working	-0.06*** (-0.08 - -0.03)	0.01 (-0.04 - 0.06)
Two or more children#Single/divorced/or widowed women	-0.00 (-0.01 - 0.01)	0.09*** (0.06 - 0.12)
Age	0.05*** (0.04 - 0.05)	0.05*** (0.04 - 0.05)
Age#age	-0.00***	-0.00***
Constant	-0.06 (-0.17 - 0.04)	0.26*** (0.07 - 0.45)
Observations	268,289	58,154
Number of id	8,841	1,917

Confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for region and year

Table A13 – Heterogeneity of motherhood employment penalties by social class of origin and country. Results from fixed-effect models. Part 1.

VARIABLES	Sweden		Denmark		Czech republic	
	Service or middle	Working	Service or middle	Working	Service or middle	Working
Presence of children (ref. No)						
Yes	-0.10*** (-0.12 - -0.08)	-0.02 (-0.08 - 0.03)	-0.02* (-0.05 - 0.00)	-0.22*** (-0.32 - -0.11)	-0.05*** (-0.07 - -0.03)	-0.09*** (-0.14 - -0.04)
Age	0.03*** (0.02 - 0.04)	0.02*** (0.01 - 0.04)	0.05*** (0.04 - 0.06)	0.07*** (0.05 - 0.09)	0.05*** (0.05 - 0.06)	0.05*** (0.04 - 0.06)
Age#age	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)
Civil status (ref. Single)						
Engaged	-0.01 (-0.04 - 0.02)	0.05 (-0.04 - 0.14)	0.09*** (0.05 - 0.13)	-0.03 (-0.16 - 0.10)	-0.02 (-0.06 - 0.02)	0.11*** (0.03 - 0.19)
Married	-0.05*** (-0.08 - -0.01)	0.06 (-0.03 - 0.15)	0.07*** (0.04 - 0.11)	-0.12* (-0.25 - 0.01)	-0.03* (-0.06 - 0.00)	0.09** (0.02 - 0.17)
Divorced	-0.04** (-0.07 - -0.00)	0.07 (-0.03 - 0.16)	0.07*** (0.03 - 0.12)	0.04 (-0.09 - 0.18)	0.01 (-0.03 - 0.04)	0.11*** (0.03 - 0.19)
Constant	0.27** (0.03 - 0.51)	0.39 (-0.10 - 0.89)	-0.30 (-0.66 - 0.06)	-0.15 (-0.85 - 0.55)	-0.15 (-0.43 - 0.13)	-0.08 (-0.44 - 0.29)
Observations	24,688	4,204	16,309	2,208	31,262	11,199
Number of id	811	137	538	73	1,020	364

Confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for region and year

Table A14 – Heterogeneity of motherhood employment penalties by social class of origin and country. Results from fixed-effect models. Part 2.

VARIABLES	Poland		Germany		Austria	
	Service or middle	Working	Service or middle	Working	Service or middle	Working
Presence of children (ref. No)						
Yes	-0.08*** (-0.11 - -0.06)	-0.15*** (-0.21 - -0.08)	-0.28*** (-0.30 - -0.26)	-0.40*** (-0.45 - -0.35)	-0.26*** (-0.29 - -0.24)	-0.36*** (-0.42 - -0.31)
Age	0.08*** (0.07 - 0.08)	0.06*** (0.04 - 0.07)	0.03*** (0.03 - 0.04)	0.05*** (0.03 - 0.06)	0.05*** (0.04 - 0.05)	0.05*** (0.04 - 0.06)
Age#age	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)
Civil status (ref. Single)						
Engaged	-0.06*** (-0.11 - -0.02)	-0.01 (-0.14 - 0.11)	-0.09*** (-0.13 - -0.05)	-0.10** (-0.19 - -0.01)	-0.05** (-0.09 - -0.01)	-0.13*** (-0.23 - -0.03)
Married	-0.03 (-0.06 - 0.01)	-0.02 (-0.13 - 0.08)	-0.15*** (-0.18 - -0.11)	-0.19*** (-0.27 - -0.11)	-0.16*** (-0.20 - -0.13)	-0.23*** (-0.32 - -0.14)
Divorced	-0.03 (-0.08 - 0.01)	-0.01 (-0.14 - 0.12)	-0.10*** (-0.15 - -0.06)	-0.19*** (-0.28 - -0.09)	-0.02 (-0.06 - 0.02)	-0.14*** (-0.23 - -0.05)
Constant	-0.79*** (-1.09 - -0.49)	0.01 (-0.71 - 0.73)	0.27 (-0.07 - 0.61)	-0.05 (-0.74 - 0.64)	0.13 (-0.11 - 0.37)	0.37 (-0.18 - 0.92)
Observations	38,632	5,869	29,480	7,471	28,335	7,400
Number of id	1,269	194	975	251	934	242

Confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for region and year

Table A15 – Heterogeneity of motherhood employment penalties by social class of origin and country. Results from fixed-effect models. Part 3.

VARIABLES	Switzerland		France		Italy	
	Service or middle	Working	Service or middle	Working	Service or middle	Working
Presence of children (ref. No)						
Yes	-0.30*** (-0.33 - -0.27)	-0.43*** (-0.50 - -0.36)	-0.14*** (-0.17 - -0.12)	-0.04 (-0.11 - 0.02)	-0.09*** (-0.11 - -0.06)	-0.07*** (-0.11 - -0.04)
Age	0.05*** (0.04 - 0.06)	0.04*** (0.02 - 0.06)	0.05*** (0.04 - 0.06)	0.03*** (0.02 - 0.05)	0.05*** (0.05 - 0.06)	0.07*** (0.06 - 0.08)
Age#age	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)
Civil status (ref. Single)						
Engaged	-0.12*** (-0.16 - -0.09)	-0.24*** (-0.37 - -0.11)	-0.10*** (-0.15 - -0.05)	-0.07 (-0.19 - 0.05)	-0.03 (-0.06 - 0.01)	-0.11*** (-0.18 - -0.04)
Married	-0.28*** (-0.32 - -0.24)	-0.54*** (-0.65 - -0.43)	-0.19*** (-0.24 - -0.14)	-0.12** (-0.24 - -0.01)	-0.06*** (-0.10 - -0.03)	-0.06* (-0.12 - 0.00)
Divorced	-0.18*** (-0.22 - -0.13)	-0.54*** (-0.66 - -0.42)	-0.15*** (-0.20 - -0.10)	-0.21*** (-0.33 - -0.08)	0.00 (-0.05 - 0.05)	0.05 (-0.06 - 0.17)
Constant	0.02 (-0.34 - 0.38)	0.27 (-0.28 - 0.82)	0.05 (-0.23 - 0.33)	0.38 (-0.28 - 1.03)	0.01 (-0.35 - 0.38)	-1.23*** (-1.59 - -0.88)
Observations	16,280	2,547	19,333	3,883	22,724	8,158
Number of id	547	87	638	128	744	266

Confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for region and year

Table A16 – Heterogeneity of motherhood employment penalties by social class of origin and country. Results from fixed-effect models. Part 4.

VARIABLES	Spain		Greece	
	Service or middle	Working	Service or middle	Working
Presence of children (ref. No)				
Yes	-0.12*** (-0.14 - -0.10)	-0.14*** (-0.20 - -0.08)	-0.16*** (-0.21 - -0.11)	-0.32*** (-0.46 - -0.19)
Age	0.04*** (0.03 - 0.04)	0.03*** (0.01 - 0.04)	0.07*** (0.06 - 0.08)	0.05*** (0.02 - 0.07)
Age#age	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)	-0.00*** (-0.00 - -0.00)
Civil status (ref. Single)				
Engaged	0.05*** (0.01 - 0.08)	-0.12* (-0.25 - 0.00)	-0.11*** (-0.19 - -0.04)	-0.17 (-0.38 - 0.04)
Married	-0.17*** (-0.21 - -0.14)	-0.09 (-0.20 - 0.03)	-0.09*** (-0.15 - -0.03)	-0.28*** (-0.46 - -0.11)
Divorced	-0.10*** (-0.15 - -0.05)	-0.04 (-0.19 - 0.11)	0.01 (-0.09 - 0.10)	-0.40*** (-0.62 - -0.19)
Constant	0.14 (-0.04 - 0.32)	0.34* (-0.02 - 0.71)	-0.85*** (-1.37 - -0.34)	-0.01 (-0.74 - 0.72)
Observations	34,570	4,379	6,676	836
Number of id	1,144	147	221	28

Confidence intervals in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The models also control for region and year

Conclusions

This thesis provided compelling empirical evidence on the interplay between social stratification and gender inequality, highlighting the role of the family of origin, on the one hand, and the family of destination, on the other hand.

Most of the studies on IEO have mainly focused on the associations between single parental characteristics, such as education, income, social class or occupational status, and children's educational outcomes. At the same time, less attention has been paid to the overall importance of the family background (which includes unobserved factors, such as parental motivations) and the role of siblings. The first study of this thesis aimed at capturing the total weight of the family background on children's educational outcomes in Italy using the sibling correlation approach. The results showed that family background explained approximately half (49%) of the variation in the likelihood of attending upper secondary education among siblings, in line with previous studies on various educational outcomes. Furthermore, the study emphasized the importance of considering additional statistical measures beyond sibling correlations to fully understand the intricacies of intergenerational educational inequality, as evidenced by the variation in sibling similarity among families with different levels of parental education (Breen & Ermisch, 2021). In addition, the heterogeneity of sibling correlations found for the probability of enrolment in science/industry-oriented curricula within different tracks highlighted the importance of examining not only conventional horizontal dimensions of IEO, such as tracks, but also the distinction among schools with different teaching programmes. Given the educational expansion in most Western European countries, as well as the importance of curricular choices for women's labour market outcomes, future studies should pay more attention to the horizontal dimensions of IEO.

The analysis of sibling correlations in the first study has been complemented by family fixed-effects models, allowing to measure the impact of child-specific factors (gender, birth order, etc.) on within-family differences in educational outcomes, controlling for unobserved confounding variables, which are constant between siblings at the family level and in the environment. The results showed that within better-off families gender differences in attending upper secondary school are non-existent, while they are

particularly strong when parents have low levels of education, which confirmed the greater vulnerability of boys compared to girls to the social-origin disadvantage. At the same time, girls were found to be less likely than boys to attend the programs which in the future lead to better labour market prospects, and this disadvantage was particularly large within the technical track. This result indicates that gender inequalities in the choice of more prospective majors exist even if girls and boys are brought up within the same family, suggesting that the differences might arise due to the diverse treatment of parents, teachers, and significant others toward boys and girls, or due to the expressive motivations of male and females related to preferences for certain school subjects and specific occupations (Barone & Assirelli, 2020). Future research might attempt to estimate these factors, their importance, and implications for further educational outcomes. Finally, with respect to the variation of gender differences in educational outcomes by birth order or sibling gender composition, the first study found no substantial and significant differences, suggesting that the choice of the curriculum is probably a result of individual preferences or parental decisions rather than the influence of siblings.

The second study of the thesis focused on the role of the dynamics that take place within the family of destination, namely on family migration. Although geographical mobility provides an opportunity for individuals to find better job opportunities offered in other places and, on average, has a positive impact on occupational attainment, its outcomes are not the same for men and women. It has been shown that migration favours men rather than women, and the roots of this cleavage lie in the context of family. Numerous studies have found that partnered women are more likely than men to find themselves in a position of “tied migrant”, relocating in response to their partners’ movement and facing negative consequences in terms of their employment chances and earnings.

The tied migration hypothesis remains a theoretical proposition, and its empirical testing has been limited by the scarcity of data that capture information on residential, family, and employment histories both in the country of origin and in the host society. The planning of family migration strategies typically occurs before migration, and this critical period of decision-making involves complex interrelationships between migration decisions and other biographical events (Mulder & Wagner, 1993; Impicciatore & Panichella, 2019). However, cross-sectional data collected in the host societies often do

not capture these pre-migration dynamics, which makes it difficult to test the tied migration hypothesis. As a result, more panel data that track the occupational trajectories of migrants in destination countries and the interplay between family and migration dynamics in the society of origin are needed to advance our understanding of this important phenomenon (see Ballarino & Panichella, 2018).

The use of a large comparative panel data (SHARELIFE) allowed the author to overcome the limitations of the previous research owing to the availability of retrospective information on one's residential changes, employment, and family dynamics. Based on such data it was possible to distinguish various migration patterns and scenarios revealing heterogeneous outcomes, as well as to disentangle the impact of migration from the impact of marriage. Overall, the study showed that the role of migration for female employment is limited. First, it does not eliminate the negative impact of family formation on women's labour market outcomes but creates heterogeneity within the group of single women and within the group of those who are married or engaged. The results revealed that the only beneficial scenario for women in terms of employment opportunities was "*single mover*", even though in the long run its positive impact disappeared turning into a disadvantage compared to "*single stayers*". In contrast, the worst outcomes were found for "*tied migrants*", confirming the existing empirical evidence. Moreover, the initial penalization of female "*tied migrants*" associated with marriage/cohabitation was amplified by a migration event and increased over age, resulting in a cumulative disadvantage. For the first time, the study analysed the impact of family separation on the employment outcomes of women, which was found to be negative.

The second aspect pointing to the limited role of family migration is that its outcomes were not the same across educational groups, namely its negative effects were limited to upper-secondary and lower-educated women. In contrast, tertiary-educated women were able to avoid the negative consequences of GM and even get benefited across all migration patterns, even when they were "*tied migrants*". These results might suggest that tertiary-educated women are either more successful in adapting to new places and finding better job opportunities due to the higher levels of human capital compared to lower-educated women, or able to bargain better outcomes in negotiations with their partners and migrate only if this decision brings employment benefits.

The third study of the thesis focused on the interplay between the family of destination and the family of origin for women's employment outcomes. On the one hand, social stratification studies point out to the importance of social origin in determining one's occupational attainment. On the other hand, gender inequality research underlines the role of parenthood, a crucial event within the family of destination, in generating gaps in labour market outcomes among women, as well as between males and females. However, there has been no evidence of interaction among these two aspects. The third study, thus, explored how motherhood penalty in terms of employment varies depending on a woman's family background and how her partner's resources interact with the influence of social origin.

The results showed that mothers with advantaged social origins have higher chances of being employed compared to mothers with less privileged backgrounds, net of the educational level. Although the data used in the study did not allow to analyse the underlying mechanisms, it might be hypothesized that such outcome is related to the direct inheritance of the family business, financial support for starting own entrepreneurial activities, getting a job thanks to parental social networks, higher motivations to return to paid work after childbearing, as well as a lower likelihood of being discriminated by employers. The cumulative disadvantage of mothers from less privileged families was further amplified by the impact of the number of children in the family. This might suggest that the increased burden of household and care responsibilities associated with a higher number of children makes the resources of the family of origin particularly important for work-family reconciliation and for mitigating the negative perceptions of employers regarding the mothers' productivity. In contrast, the role of the partner's resources in the interplay with a woman's social origin was found to be limited, as they compensated for the negative impact of motherhood only for women from better-off families having two or more children.

Furthermore, a country comparative analysis showed that DESO on motherhood employment penalties operated differently across various national contexts. Relatively larger differences in motherhood penalties among mothers from less privileged backgrounds and those from better-off origins were likely to be found in countries with limited support for female workforce participation, traditional gender role attitudes, as well as highly rigid labour markets and limited or non-existent secondary segment. In

contrast, lower DESO on motherhood employment penalties was likely to occur in contexts with extensive public childcare services, egalitarian gender role attitudes, and flexible labour markets with open mobility patterns. At the same time, DESO seemed to be also less pronounced in Southern European countries characterised by very low female employment rates.

To conclude, the thesis underlined the importance of the processes that happen both within the family of origin and the family of destination in shaping women's educational and labour market outcomes and creating various patterns of cumulative (dis)advantage. On the one hand, the family background shared by the siblings has a substantial weight in determining educational outcomes. On the other hand, even when the common family environment is accounted for, gender discrepancies do not disappear completely, which is particularly important when the choice of major is considered. Despite the reversal of the gender gap in educational attainment, women are still underrepresented in engineering, mathematics, and computer sciences, leading to relatively higher labour market returns. Hence, future research should explore the gender differences in the treatment of parents, teachers, and significant others toward boys and girls, as well as in individual motivations and preferences for certain school subjects or occupations.

In addition to the choice of study field, a crucial factor contributing to gender differences in labour market is the formation of one's own family and the processes happening with it. While individual migration decisions are likely to improve one's occupational attainment, family migration brings negative outcomes for women, which appear already at the moment of separation and increase over age. At the same time, tertiary educated women, moving in response to their husband's relocation, are able to avoid the penalties associated with family migration and even get benefited. These findings leave space for future studies which should investigate the processes of decision-making and the mechanisms allowing highly educated women to obtain positive outcomes from family migration.

Finally, this work has shown how the family-of-origin (DESO) and the family-of-destination (motherhood, partner's resources) factors interact while shaping women's employment outcomes. Mothers from less privileged families have lower chances of being employed compared to mothers from better-off backgrounds, and this disadvantage is further amplified as the number of children increases. Moreover, partner's resources

make no difference for the cumulative disadvantage of these mothers, while they compensate for the negative impact of motherhood for women from better-off families having two or more children. In addition, it was shown that the interplay between motherhood and DESO varies across countries having different labour market structures, gender cultures, and welfare regimes. Future studies should uncover the role of the mechanisms underlying DESO for mother's employment, as well as scrutinize the cross-country differences.

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