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Intended Childbearing and Integration: Socio-Demographic Determinants Among Italian and Foreign Adolescents

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Introduction

Italy, together with the other highly industrialized western countries, has recently entered a delicate demographic phase consisting in declining population, low fertility, and high childlessness rate. The systemic low birth-rate is having serious negative effects on multiple levels, spanning from the unsustainability of the welfare system to the limited economic growth. By consequence, the issue of tackling low fertility has been rapidly moved on top of the policymakers' agenda, and welfare measures aimed to recover the lost fertility progressively gained popularity. The importance of policies has made particularly evident by the contributions of some authors, that highlighted how the process of declining birth-rates could have been influenced by external constraints and gender developments, potentially leading to a gap between actual and desired fertility (McDonald, 2006). Hence, beside studying actual fertility, investigating also childbearing intentions became important for a comprehensive understanding of the declining births phenomenon.

Furthermore, considering that influence fertility with policies could often be a complicate matter, and almost none among all the western countries has stably returned to replacement levels of 2.1 children per woman, western ruling class faced itself obliged to compensate low birth-rates through in-migration flows. At first, this approach helped those countries to address important issues linked with declining populations, such as young labour shortages. However, the fact that in-migration *per se* can directly have an impact on fertility remains a far more complex matter to assess. Moreover, some ethnic groups tend to adapt their reproductive behaviours to the ones of the native population, to the extent that fertility of migrants has been often considered to be an indicator of their level of integration within the host society.

Part of the demographic research has consequently focused on two areas. At first, it analysed which factors influence low fertility rates and high childlessness the most, studying both actual and desired fertility. Secondly, which factors influence fertility or childlessness patterns of immigrant women within the respective country of arrival. However, the relevant research on this topic that has been conducted taking Italy as case study shares a common denominator: it has mainly focused on adult women. The present thesis, while examining similar socio-demographic variables, focuses on a markedly different sample; on May 20th, 2024, the "Istituto Nazionale di Statistica" (Istat) published the data from a sample survey named *"Bambini e ragazzi: comportamenti, atteggiamenti e progetti futuri",* with the aim of collecting information on the life of Italian and foreign adolescents and their future, comprised

their intentions as regard family formation (Istat, 2024a). Since studying also childbearing intentions is important, focusing on attitudes of young adolescents who are not yet involved in reproduction, but may well reflect the preferences of their parents and the future fertility trends, could be useful to monitor possible cultural changes in this regard. That stated, rather than focusing on the exact number of desired children, this thesis investigates how some socio-demographic variables reliable from the Istat's survey are associated with adolescents' intentions to have a child or not, focusing than on expectations regarding childlessness. Moreover, despite the scarce comparability with adults, in order to create a *fil-rouge* with the existing literature this dissertation focuses only on adolescent girls. Finally, as the very scope of the Istat's survey was that of assessing the level of integration of foreign young citizens and considered the growing attention for migration while studying fertility, this study dedicates particular importance to a comparison between natives and foreigners.

Hence, this dissertation aims to answer the following research questions:

- **RQ1:** Do adolescents in Italy express a strong intention to have children in their lifetime?
- **RQ2:** Which socio-demographic variables are associated with intended childbearing among adolescents in Italy?
- **RQ3:** Do socio-demographic predictors of intended childbearing differ between Italian and foreign adolescent citizens?

In order to properly answer the research questions, rigorous statistical methods have been employed; beside descriptive statistics to better understand the selection criteria of the variables, a Principal Component Analysis has been performed to reduce the dimensionality of the many independent variables, and, secondly, a set of multinomial logistic regressions have been estimated to assess the effect of the independent variables on the outcome category. All the statistical computations have been carried out using the software "*R-Studio*".

1. Low Fertility and Fertility by Ethnic Groups in Italy

1.1 Cultural Explanations

The following subsection reviews the main theoretical and empirical contributions related to fertility and childlessness in Italy. Few theories comprehensively explain contemporary fertility behavior, and even fewer address childlessness in an integrative way (Tanturri *et al.*, 2015). Moreover, none of these frameworks has ever been applied to Italian adolescents' fertility intentions. Considering that adolescents generally see childbearing as a distant future, psychologists have argued that in expressing their intentions about family formation people of young age are more likely to reflect childbearing preferences of their parents. For this reason, research investigating a possible relationship between socio-demographic factors and childbearing intentions of adolescents is missing, especially in Europe. In addition to, construct a theorical framework that can possibly fit adolescents' fertility intentions is more challenging than for adults, for whom insights about their socio-demographic demographic characteristics are often more complete. Based on the information reliable from the Istat' survey, this thesis emphasizes cultural and gender-based explanations over economic ones, drawing primarily on the Second Demographic Transition theory, post-modernist perspectives, and their critiques.

While the framework extends beyond these theories, few studies have compared how micro-level factors shape fertility and childlessness among natives and migrants within the same country, whereas research on this topic taking adolescents as sample is almost non-existent. The only paper using adolescents as sample, and that has been possible to recover from open sources online, is quite dated and compares the fertility expectations of Mexican-American and Anglo adolescents in Arizona (Sorenson, 1985). Indeed, the main existing literature has concentrated on theoretical perspectives explaining fertility or childlessness patterns differentials between majority and minority groups of adults. Some of these theories are based on specific assumptions regarding adult-life course, making their applicability to adolescents' childbearing intentions impossible. These perspectives have been consequently discarded. Other theories, on whose the thesis focuses more in detail, express instead more general assumptions and could be applied more easily to young people.

1.1.1 The Second Demographic Transition and its Criticisms

The profound social transformations of the second half of 20th century within the industrialized countries, marked by sub-replacement fertility, a shift toward individualistic values, the emergence of diverse living arrangements beyond marriage, the growing separation between marriage and reproduction, and the continuous aging of populations, led several scholars to formulate the concept of the "Second Demographic Transition" (SDT), establishing the existence of a new phase with distinctive features that sharply contrast with those of the previous period (Lesthaeghe, 2014). The "First Demographic Transition", in fact, referred to the unseen declines in fertility and mortality within the western countries from the 18th and 19th centuries onward, accompanied by the preservation of traditional family formation systems (Lesthaeghe, Surkyn, 2007). From this perspective, an equilibrium was expected to emerge in an aging yet stationary population, characterized by an average total fertility rate of around 2.1 children per woman, ensuring zero population growth and life expectancy exceeding 70 years (Lesthaeghe, 2014). By contrast, the SDT, introduced by Lesthaeghe and Van de Kaa (1986), has signified the end of the equilibrium paradigm, emphasizing a new demographic regime (Lesthaeghe, 2014). At first, between the First and the Second Demographic Transitions, the motivations for parenthood differ in two distinct ways (Lesthaeghe, Surkyn, 2007). During the First Demographic Transition, the decline in fertility was driven by a growing emotional and financial investment in the child, what Ariès called the "king child" era (Lesthaeghe, Surkyn, 2007). In contrast, during the Second Demographic Transition, the main motivations for having children centers on adult self-realization, becoming a parent as part of achieving a more complete and fulfilling adult identity or lifestyle (Lesthaeghe, Surkyn, 2007). This shift was also supported by the development of highly effective hormonal and other modern contraceptive methods (Lesthaeghe, Surkyn, 2007). Finally, the FDT was marked by earlier and more universal marriages, declining cohabitation, and low out-of-wedlock fertility, whereas during the SDT these trends have reversed, opening the doors to marriage postponement, premarital cohabitation and long-term cohabitation becoming common, and out-of-wedlock fertility rising (Lesthaeghe, 2014). Also, remarriage after divorce or widowhood have both declined (Lesthaeghe, 2014).

Countries undergoing the Second Demographic Transition are so expected to face a death rate exceeding the birth rate (Van de Kaa, 2002). This is because mortality will continue to rise due to population aging, while fertility will remain low, as the number of children women have is likely to remain below replacement level, resulting in declining populations (Van de Kaa, 2002). Furthermore, advanced industrialized countries are expected to remain

destinations for immigration, with the latter helping to mitigate the demographic consequences of persistently low fertility (Van de Kaa, 2002).

Of course, the Second Demographic Transition is not merely based on a declining population and low birth rate, but rather on a true revolution of societal values, with its roots within the spread of post-modern individualism (Van de Kaa, 2001). The early shift marking the passage from the First to the Second Demographic Transition came in fact from a strong public manifestation of individual autonomy, directed against all expressions of external institutional authority, especially the ones of the Catholic Church (Lesthaeghe, 1992). This was firstly mirrored by the fact that divorce rates began to increase, signaling plain protest against conformity and conventionalism of marriage that was by then considered a bourgeois practice (Lesthaeghe, 1992). This "bourgeois family model", that mostly characterized the first transition, have been replaced by an "individualistic family model", in which relationships between men and women are increasingly viewed as a source of mutual emotional fulfillment, with the birth of children seen as an optional contribution to that goal (Van de Kaa, 2002). As a consequence, the number of cohabitations, that was already widespread among voters for the non-conformist new left and was totally absent among voters for religious parties, rose (Lesthaeghe, 1992).

This phenomenon of rising cohabitation, however, has developed in a very heterogeneous way across the European continent, and, in some countries, marriage still presents itself as the principal framework for family formation (Lesthaeghe, 2020). Particularly, two distinct population groups emerged in Europe (Lesthaeghe, 2020). The first includes the Nordic and Western countries, along with the German-speaking trio and Estonia, within which the percentage of women aged 25-29 living in couple and cohabiting experienced an early take-off during the 1970s and surpassed the 50% level by 2000–2004 (Lesthaeghe, 2020). The second group comprises the remaining European countries, characterized by a later take-off in the 1990s and a generally slower progression thereafter (Lesthaeghe, 2020). Within this group, Spain scored the highest level of cohabitations, while Italy, Poland, and Romania occupy the lower end of the distribution (Lesthaeghe, 2020). One possible explanation for this non-convergence could be the "willingness" factor, or cultural acceptability, a crucial condition for the spread of cohabitation (Lesthaeghe, 2020). Historically, cohabitation in Europe was stigmatized within populations characterized by a strong conjugal marriage tradition (Lesthaeghe, 2020). However, a major ethical shift toward greater tolerance and individual autonomy emerged as early as the 1960s in Western societies and has since extended to other regions, such as Latin America (Lesthaeghe, 2020). This so-called "ethics revolution" brought

a de-stigmatization of divorce, abortion, homosexuality, euthanasia, and suicide (Lesthaeghe, 2020). While this transformation is most advanced in the Nordic countries, followed by Western Europe, it is also clearly observable in Spain and, albeit to a lesser extent, in Italy, where traditional family values persist (Lesthaeghe, 2020). In Italy, the fact that traditional norms continue to link marriage closely with childbearing is confirmed by a broad bunch of literature, according to which women who lead trends in voluntary childlessness and delayed childbearing tend to hold less traditional values, often being nonreligious and more likely to cohabit rather than marry in their first partnership (Mencarini, Tanturri, 2008). However, although in Italy marriage is still widely seen as a necessary preliminary to childbearing, cohabitation has become much more widespread since the start of the 21st century, the number of children born outside marriage has increased, and in 2023 42.4% of births in Italy occurred outside of marriage (Istat, 2024b), (Tocchioni, 2018), (Tanturri *et al.*, 2015).

The shift from marriage to cohabitation went hand in hand with the disappearance of restrictions on sexuality, another salient feature of the Second Demographic Transition (Lesthaeghe, 1992). Of relevance in this regard is the connection with the technological change, with the widespread availability of effective contraception that has undoubtedly contributed to shape the fertility behavior of people (Van de Kaa, 2001). The introduction of reliable contraceptive methods around the mid-20th century, moreover, often accompanied by legislative changes permitting sterilization and abortion, significantly expanded the demographic options available to successive cohorts broadening the freedom of choice on sexual matters, especially for women (Van de Kaa, 2001). Therefore, also voluntary childlessness became increasingly significant and acceptable (Van de Kaa, 2001).

As McDonald argues, this change in attitudes has been rather coercive, and could be explained by the spread of social liberalism, new capitalism, and globalization, which pushed individuals towards individualism, raising by consequence their economic and educational aspirations (McDonald, 2006). According to this perspective, investing in human capital started to be considered as a rational strategy to hedge against the risks of unemployment and social insecurity, intrinsic characteristics of the western labor markets (McDonald, 2006). Thus, within this context, delaying marriage and childbearing became a forced choice (McDonald, 2006). In fact, as regard childlessness, authors often distinguish between “childless”, namely an individual that does not have children because of external constraints, and “childfree”, an individual who, by contrast, deliberately chooses not to have children (Neodemos.info, 2024).

For McDonald, the effort of this shift of preferences was mostly characterized by gender developments because women would be likely to be the most risk-averse, because their

economic gains and opportunities are comparatively more jeopardized by family formation than men's (McDonald, 2006). The expansion of female education and employment, in fact, has blurred the boundary between professional and domestic life, and couples must now negotiate a balance that accounts for both domains, as women are less willing to prioritize their partners' careers (Lesthaeghe, 1992). This dual-career reality often reduces union stability and postpones family formation, leading by consequence to persistent sub-replacement fertility levels (Lesthaeghe, 1992), (Lesthaeghe, Surkyn, 2007). According to this perspective, very low fertility in advanced countries would be the outcome of a tension between the high level of gender equity achieved in individual-oriented social institutions and the persistent gender inequity that remains within family-oriented institutions (McDonald, 2000).

Building on these assumptions, improved educational opportunities for women in developing countries started to be seen as one of the primary institutional factors that could be influenced by policy to tackle low fertility (Kasarda, 1979). A substantial body of empirical research has further confirmed that education has a stronger and more consistently negative relationship with fertility than any other individual determinant (Kasarda, 1979). Female education, of course, influences or interacts with a wide range of factors, including age at marriage, employment opportunities outside the home, social mobility, husband-wife communication, religiosity, infant mortality, and access to contraceptive information and methods, each of which suggests having a direct impact on fertility (Kasarda, 1979).

The positive relationship between education and childlessness is particularly evident in Italy. Evidence from North-Eastern Italy, the area of the country with the highest prevalence of childlessness in 2016, shows that highly educated women are disproportionately represented among those who remain voluntarily childless (Dal Ben, 2017). Similar results emerged from another study that focuses on Italian women born in the 1950s and 1960s, for which higher education is linked to a greater likelihood of remaining childless, whereas women with either lower or higher-than-average educational levels are more likely to have larger families (Mencarini, Tanturri, 2006), (Mencarini, Tanturri, 2008). Moreover, it has been found that profiles of women with a university degree and a managerial position are more likely to be voluntary childless (Tanturri, 2013). Others have found that, whereas a greater share of highly educated women choose to remain childless, higher education has a positive effect on the probability of having a second or third child (Dalla Zuanna, Impicciatore, 2016).

The positive association between childlessness and women's educational attainment may stem either from the postponement of childbearing or from the fact that higher education is often associated with less traditional value orientations (Tocchioni, 2018). The latter

interpretation is supported by evidence showing that within Italian couples in which women hold less traditional roles, it is more likely to manifest disagreement between the partners in the reproductive decision-making concerning having a first-child (Rosina, Testa, 2009). Such disagreement is particularly likely to emerge within Italian couples cohabiting, in which women are working, and have reached higher education levels (Rosina, Testa, 2009).

To the gendered developments driving the positive relationship between higher women education and childlessness were give particularly credit by comparing childlessness patterns of men and women. Among men, has been found that voluntary childlessness appears to be mainly associated with lower educational attainment, poorer health, and disadvantaged social status (Tanturri, 2013). Conversely, among women, the opposite pattern emerges, and those holding a university degree and occupying managerial or professional positions are more likely to be voluntarily childless (Tanturri, 2013).

Comparative research has also confirmed the positive association between higher female education and childlessness in Italy, pointing to the fact that in other countries the relationship is weaker or even reversed. The different pattern observed suggests that education *per se* would not represent a one-side driver of childbearing preferences, but rather its effect may depend on other structural factors. For instance, a study comparing childlessness patterns in Finland and Italy shows that the relationship between education and childlessness reveals a positive gradient in Italy and a negative one in Finland (Donno, Tanturri, 2020). According to the authors, this opposite effect is because Italy, contrary to Finland, is still far from being ready to fully accept women aspirations for untraditional roles (Donno, Tanturri, 2020). By consequence, in Italy high educated women still represent a restricted group, more selective in union formation, with less chances to find a partner and to form a family (Donno, Tanturri, 2020). Similar patterns emerge in other countries, particularly those that are German speaking, within which women with medium levels of education have remained childless slightly more often than their less educated counterparts (Beaujouan *et al.*, 2015). This pattern is observed in Austria, Switzerland, Germany, Croatia and Romania, as well as in Italy (Beaujouan *et al.*, 2015). By contrast, in other countries the positive educational gradient in childlessness generally declined for younger cohorts, with the gap between women with medium or high education and those with lower education narrowing (Beaujouan *et al.*, 2015).

A key reason why the relationship between education and childlessness vary across countries may be found at the policy level. As long as a policy succeeds in facilitating the so-called process of "dematernalisation", that would enable women to reach a satisfactory work-family balance, a sensibly positive effect on births will be observed (Mathieu, 2013). In

particular, dematernalisation refers to the shift of part of the social and economic costs of childbearing from mothers to external actors, including the state, the market, and other family members such as fathers and grandparents (Mathieu, 2013). Notably, and not by chance, in those countries having institutional contexts that make reconciling family and employment harder, and by consequence with high direct and indirect costs of raising children, such as Italy, it is by achieving a stable and well-paid position or by forming a male-breadwinner couple that women entrance into motherhood is facilitated (González, Jurado-Guerrero, 2006).

Indeed, according to McDonald, it would be reasonable to accept that public policies could have played a crucial role in tackling low fertility rates. Although the evidence on the effectiveness of pro-natalist policies was scarce during the last decade, many governments started to implement family policies obtaining, on average, positive results. Particularly, positive association between high female participation within the labour market and high fertility rates has been possible to achieve in countries where policies aimed to enable women to combine work with child rearing were implemented (McDonald, 2006). In these contexts, a deeper investment in human capital may even exert a positive impact on childbearing lifetime intentions (Testa, 2012).

That considered, according to McDonald, a possible solution to low fertility cloud be creating new institutional settings in which it is the state that, through public policies, provides for the necessary support to family life. On those bases, core provisions of the Second Demographic Transition have been criticised. In fact, the suggested pattern that rising economic aspirations among the younger population would have contributed to diffuse shared materialistic values, undermining by consequence the attitude toward family, is partially disconfirmed by numerous surveys for which women reported that they would have had more children if public support had been greater (McDonald, 2006).

Interestingly, in secular societies like Sweden, fertility remains relatively high and childlessness low despite growing individualization and family instability (Tanturri *et al.*, 2015). A comparable pattern is observed across all the Nordic region, where a flexible educational system is in force, pro-natalist policies are present, and social democratic welfare governance is strong (Vasireddy, 2023). By consequence, the educational gradient is reversed, and lower-educated women are more likely to remain childless (Vasireddy, 2023).

Other scholars, notably David Coleman, have also raised substantial criticisms of the Second Demographic Transition framework, arguing that the SDT would not constitute a true "second" transition, but rather more probably a continuation of the First (Coleman, 2004). Several behaviors associated with the second transition were, in fact, also present in the 18th

and 19th century (Coleman, 2004). Cohabitation, extra-marital births, marital-breakdowns, divorce, were all present in earlier centuries in few parts of Europe, like Iceland, Sweden and Hungary (Coleman, 2004). Outside Europe, instead, divorce and easy re-marriage for men represent traditional features for some polygamous African societies, in some Islamic countries, and in traditional Japan, whereas extra-marital births were quite diffused in Latin American and the Caribbean, and to some extent among US blacks, even before the rise of the first transition (Coleman, 2004). Nevertheless, given the evident differing nuptiality and fertility regimes between the two transitions, it is difficult to fully align with Coleman's position on this point (Lesthaeghe, Surkyn, 2007). Moreover, according to Coleman, the SDT would explain a set of cultural and behavioral phenomena, such as individualization, cohabitation, or changing partnership norms, that cannot be considered as "demographic", but rather as reflections of a shifting value system having a doubt causal link with persistently low fertility (Coleman, 2004). This argument, as showed also earlier, appears to be more strongly supported by empirical evidence, as economic, institutional, and policy factors often exert a decisive influence in shaping fertility in some countries (Coleman, 2004), (McDonald, 2006). He also criticizes the theory's implicit assumption of convergence, noting the existence of considerable heterogeneity in fertility patterns across European countries (Coleman, 2004). Where some have maintained near-replacement fertility levels, in fact, others face the so called "*lowest-low*" fertility, for instance Italy, scoring under 1.3 children per woman (Coleman, 2004). Finally, Coleman doubts the universality of the SDT, arguing that its conceptual foundations are rooted in Western cultural and historical contexts, and therefore may not be fully applicable to non-Western societies (Coleman, 2004). By the late 1980s, as a matter of fact, the main features of the Second Demographic Transition appeared confined to Western and Northern Europe, as cohabitation and non-marital fertility remained limited in the south and east of the continent, where traditional marriage and older family patterns persisted (Lesthaeghe, Surkyn, 2007).

Beyond the Second Demographic Transition, other theories, especially the ones involving economic decision-making, are less applicable to adolescents. Among those, it is important to mention the *rational choice theory,* according to which the decision to have children would be rational in the sense that couples weigh the costs and benefits of childbearing, considering their income level and personal preferences (Tanturri *et al.*, 2015). Thus, a positive relationship between income and fertility is expected, although couples may choose to invest in the quality rather than the quantity of children, opting for fewer offspring

when the costs of raising them increase (Tanturri *et al.*, 2015). This phenomenon is what Becker (1960) refers to as the "substitution effect" (Becker, 1960).

1.1.2 Migrants' Fertility as an Indicator of Integration

As many western countries are experiencing fertility rates below 1.5 births per woman, governments of all these nations have stated that they consider such levels as too low (McDonald, 2006). When fertility remains moderately below the replacement level, in fact, generational decline occurs gradually and, if needed, can be mitigated through in-migration (McDonald, 2006). This aspect has largely characterized the strategy of Western countries, where a third demographic transition may now be emerging (Coleman, 2006). The composition of their national populations, in fact, is being profoundly and permanently transformed by substantial immigration from distant regions and diverse ethnic or racial backgrounds, combined with increasing emigration of the native population (Coleman, 2006).

Although immigration can help alleviate labor shortages, particularly the lack of young skilled workers in aging societies, the fact that it can directly address the problem of persistently low fertility remains a more complicated matter. If individuals who grow up in one cultural context and move to another maintain behaviors from their original environment, adapt their actions to the new cultural setting, or display a complex mix of continuity and change in how they live within the new society, have been studied initially by cross-cultural psychology (Berry, 1997). *Acculturation* refers to the psychological changes experienced by individuals as a result of interaction and engagement with members of another culture, typically the host society. This process involves both the relinquishment of aspects of one's original culture, *culture shedding*, and the adoption and internalization of elements from the host culture, *culture learning* (Berry, 2001). Depending on the degree to which they maintain their original cultural identity and adopt elements of the new culture, migrants may follow different acculturation strategies (Berry, 1997). From a psychological perspective, J. W. Berry proposes a model of four acculturation strategies that conceptualizes acculturation from migrants' point of view. The model is based on two key dimensions: cultural maintenance, namely the extent to which individuals preserve their heritage culture, and cultural participation, that is the extent to which they engage with the host society. Four acculturation strategies follow: *assimilation*, where individuals adopt the host culture and abandon their own; *separation*, where they preserve their original culture while rejecting the host one; *integration*, where they combine both cultural

identities; and *marginalization*, where they identify with neither culture (Berry, 1997). This bi-dimensional model can be summarized by *Table 1* as follows:

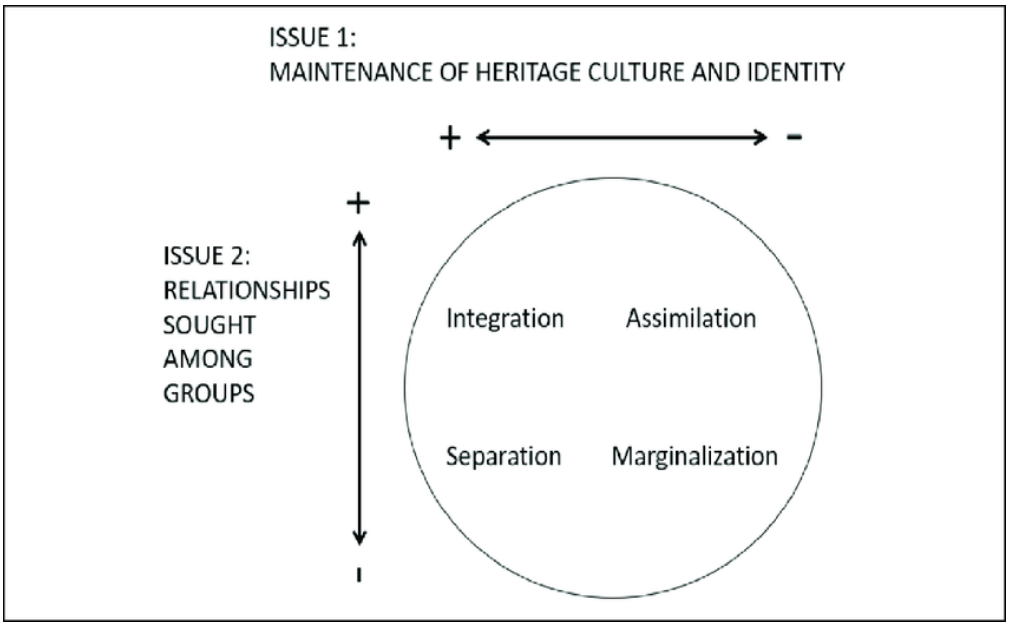

Figure 1: Berry's four strategies of acculturation (Berry, 1997)

Building on the idea of acculturation, within demographic research have been developed different theoretical frameworks, each emphasizing different mechanisms through which different aspects such as culture and other social and structural factors shape reproductive behavior differently between locals and migrants. Regrettably, research has focused more on comparing total fertility rates rather than childlessness patterns, although most of these theories would be applicable to both cases (Boyd, 1989).

The first perspective that has been developed is known as the *characteristics hypothesis* (Martin, 2020). It argues that fertility levels are shaped by individuals' acquired attributes, such as education and income, rather than culture factors (Martin, 2020). By consequence, according to this view, fertility differences across groups must disappear and tend toward assimilation if all individuals share the same socioeconomic characteristics (Martin, 2020). Adopting an economic standpoint rather than a cultural one, this theory highlights the role of opportunity costs associated with childbearing, which are influenced by women's potential earnings in the labor market (Martin 2020). Thus, in societies where work–family reconciliation policies are weak, highly educated women, typically those with higher earnings, would experience greater opportunity cost for childbearing (Martin, 2020). According to this perspective, this pattern would be observed across all ethnic groups (Martin, 2020).

Although it is important to consider socioeconomic characteristics of groups when it comes to assess ethnic fertility differences, this theory could be not well suited to recent immigrants from developing countries, whose demographic patterns have emerged in markedly different economic and risk contexts (Coleman, 1994). Examining the impact of the Great Recession on the fertility behavior of migrants in Italy and Sweden, it has been found that the probability of having a child during the economic downturn decreased among long-term migrants in Italy, suggesting that greater economic integration made their fertility more responsive to macroeconomic fluctuations, whereas did not influence short-term migrants, whose fertility remained high (Alderotti *et al.*, 2019). Moreover, in another comparative analysis of fertility change during the same period, it has been suggested that fertility among foreign women in Italy declined more than it did among natives, because native fertility was already very low and foreign women experienced greater economic vulnerability than their Italian counterparts did (Graham *et al.*, 2016). Other scholars have instead found that the patterns of fertility intentions within 3-years' timeframe are different for natives and migrants as a function of educational level and labor market status (Mussino *et al.*, 2021). In addition to, the authors of the same study found that the most substantial difference between natives and migrants concerns childless women (Mussino *et al.*, 2021). Specifically, the predicted probability of having no intention to have a first child would be higher among natives than among migrants, indicating a distinct relationship with respect to childlessness (Mussino *et al.*, 2021). Similar results emerged from a comparative study between Italy and Russia, showing that education level affects natives and migrants differently (Mussino, Van Raalte, 2008). In particular, for the same level of education, migrant women tend to become mothers earlier than Italian-born citizens (Mussino, Van Raalte, 2008).

A second perspective that is closely related to the *characteristics hypothesis* is the *assimilationist hypothesis*. This theory suggests that minority groups will gradually adopt to the behaviors of the dominant population as a process of acculturation (Boyd, 1989). The "melting pot" metaphor has long symbolized this specific type of assimilation within the American context, describing the blending of diverse ethnic identities into a single national culture. This model rests on the idea of convergence between the behavior of migrants and the ones of the host society, fostered to promote integration and social harmony. This perspective is one-sided, with migrants expected to conform to the norms of the dominant group and not vice-versa. Following this perspective, the *adaptation hypothesis* could be viewed as a demographic counterpart of this assimilationist model (Milewski, 2007). This theory would suggest that migrants' fertility patterns are expected to gradually converge towards those of the

host population, as migrants are exposed to social, cultural, as well as the particular economic conditions of the destination country (Milewski, 2007). However, as showed in literature, such convergence does not always necessarily manifest in a full cultural assimilation, but it may rather reflect pragmatic adjustments to the structural constraints and opportunities encountered in the new environment (Impicciatore *et al.,* 2020). On the one hand, evidence consistent with *adaptation* has been found for first-generation Albanian women in Italy, whose fertility patterns increasingly resemble those of natives over time, particularly as regard the risk of first-birth (Impicciatore *et al.,* 2020), (Garcìa-Pereiro, Paterno, 2023). Moreover, this perspective could also help explain why some descendants of migrants exhibit fertility levels comparable to those of natives, as prolonged exposure and integration foster behavioral convergence over generations in some countries (Kulu *et al.*, 2019).

The observation of the demographic behavior of specific minority groups within American society, especially black women, led Goldscheider and Uhlenberg to develop the *Minority Group Status Theory*, which emphasizes the role of social position and perceived disadvantage in shaping fertility behavior among minorities (Goldscheider, Uhlenberg, 1969). According to this perspective, it is suggested that a minority group facing discrimination and lacking strong cultural norms promoting large families and does not restrict or discourage the use of effective contraception tends to exhibit fertility levels lower than those of the majority population, pointing toward the so called "adaptive constraint effect" (Goldscheider, Uhlenberg, 1969). Conversely, if the acculturation of a minority group is associated with the maintenance of strong adherence to religious or sociocultural norms promoting larger families or restricting the use of contraception, then minority group status is likely to result in higher fertility among the minority compared to the majority population, pointing toward the so called "reactive ethnic effect" (Goldscheider, Uhlenberg, 1969). Indeed, a crucial factor in this context is both the extent and the aspiration toward acculturation, which do not necessarily equate to full integration or assimilation into the host society (Goldscheider, Uhlenberg, 1969). It follows that when the desire for acculturation is not embedded in the social context of a minority group, its members may become focused on maintaining group identity and numerical strength (Goldscheider, Uhlenberg, 1969). As a result, resistance to assimilation often reinforces traditional family norms and practices that support higher fertility levels (Goldscheider, Uhlenberg, 1969). Moreover, the relationship between minority group status and fertility might function ununiformly across all socioeconomic levels (Goldscheider, Uhlenberg, 1969). This pattern typically emerges among the second and third generations, as they experience upward social mobility from the lower social classes, often accompanied by

geographical mobility away from the original "ghetto" areas (Goldscheider, Uhlenberg, 1969). Consequently, Goldscheider and Uhlenberg (1969) have found greater insecurities associated with minority group status among more educated black women than among black women of low education, and this pattern will vary for immigrant minority groups in terms of the degree and swiftness of their subjective acculturation strategies (Goldscheider, Uhlenberg, 1969). Considering that structural assimilation reflects the level of discrimination and social distance between groups, the minority status effect described by Goldscheider and Uhlenberg (1969) is likely to have a weaker impact on fertility as these barriers decline (Ritchey, 1975). In the U.S. South, conversely, where racial inequality has been most pronounced, its effect is expected to be stronger (Ritchey, 1975).

Although their reasonings align with several empirical studies, Goldscheider and Uhlenberg's theories have been criticized. To begin with, they do not specify how differences between majority and minority groups manifest at lower socioeconomic levels (Ritchey, 1975). Moreover, when excluding the South, Sly has found that non-white women show lower fertility than white women at all education levels, suggesting that race and education may interact not only as function of social class (Sly, 1970). Thus, he argues that this pattern fits better the *characteristics hypothesis*, since for the same level of education, black women tend to have fewer occupational opportunities and lower income and would be more reasonable to think that are these structural disadvantages that explain their lower fertility (Sly, 1970).

Similarly to the idea of the *minority status hypothesis*, according to which strong in-group social norms that promote family formation and childbearing may lead to higher fertility among migrants, the *socialization hypothesis* emphasizes values, norms, and behaviors internalized during childhood, assuming their persistence throughout the life course (Milewski, 2007). Consequently, immigrants tend to reproduce the fertility patterns prevailing within their country of origin, even when these differ from those of the host society (Milewski, 2007). As a result, migrants originating from different countries may display distinct fertility behaviors even when residing in the same destination country (Milewski, 2007). Following the contributions of the socialization hypothesis on the role of specific sociocultural norms in shaping fertility differentials, another approach, known as the *particularized ideology hypothesis*, argues that demographic behavior might be precisely shaped by the specific cultural norms and values of a group (Hammel, 1990). These cultural norms are often associated with attitudes toward marriage and the use of contraception, but they include also the broader set of values and attitudes that guide individual decision-making (Martin, 2020). From this perspective, it would be possible to explain why certain communities, despite sharing similar

economic conditions, but differ in language or traditions, display different demographic behaviors (Hammel, 1990). Thus, the cultural norms internalized before migration can remain deeply rooted after settlement in the host country, continuing to shape reproductive behavior across more generations (Coleman, 1994).

Building on these latter underpinnings, research has found that Moroccan women in Italy, in contrast with Albanians, exhibits a fertility that conforms to the pattern of their country of origin (Impicciatore *et al.,* 2020). Similar results came out from another research that has showed that migrants settled in Italy and originating from North Africa, particularly those in endogamous marriages, tend to have significantly higher fertility rates than those originating from Eastern European countries (Mussino, Strozza 2012). From a comparative perspective between Italy and Spain, moreover, emerged that Moroccan women display higher fertility rates than Romanian women in both contexts (Carella *et al.*, 2021). Therefore, examining the fertility patterns of migrants from Poland and Romania by comparing them with non-migrants in their home countries and in different destination countries, including Italy and the United Kingdom, a study found that Romanian migrant women and men, including those in mixed couples, exhibit fertility rates comparable to those of individuals who remain in their countries of origin and fewer children compared to both Italian and British people (Cantalini, Mussino, 2022). Within another study conducted in Lombardy region similar patterns emerged, and Romanians were found to have a very low risk of having a child, whereas Moroccans and Albanians displayed a higher risk (Mussino *et al*., 2015).

Nevertheless, among migrant women, the ones sharing a preference similar to their countries of origin represent a minority, whereas the majority tend toward assimilation (Mussino, Ortensi, 2018).

Beyond these theories, I consider others, more centered on adult life-course transitions, to be less applicable to study childbearing intentions of adolescents. Among them, the *disruption hypothesis*, suggesting a negative effect on the fertility of migrants upon arrival in Italy, due to factors such as partner separation or difficulties in finding a partner in the destination country (Miaci, 2025). Moreover, the *interrelation hypothesis*, suggesting that migration and fertility are closely linked, with women being more likely to have children in the initial years following migration (Miaci, 2025). According to this perspective, the observed increase in birth risks immediately after migration can be attributed to the overlap of multiple life events with migration, such as marriage or the re-establishment of a previous household under new conditions (Miaci, 2025). Finally, the *selection hypothesis,* arguing that the difference in fertility between migrants and non-migrants in the country of origin could be

attributed to the fact that migrants themselves constitute a selective group whose fertility preferences are more likely to resemble those of the destination country than those at origin (Miaci, 2025). This similarity in preferences may, in turn, play a role in the selection of the destination country itself (Miaci, 2025). In this case, there is no ground to assume that the adolescent migrants composing the sample autonomously chose Italy as the destination country, and it is more logical to assume that the parents made the choice, although usually a relevant influence parents-children exists.

1.2 Childbearing Intentions of Adolescents Aged 11-19

Research on both actual and intended fertility intentions has mainly focused on adult female populations, overlooking adolescents who are in the early stages of forming attitudes toward family and childbearing. By consequence, although the Second Demographic Transition framework has been widely used to interpret fertility behaviours across European countries, little is known about how its assumptions apply to adolescents. In both developing and developed countries, fertility patterns often diverge significantly from individuals stated ideals and intentions and such discrepancies suggest that actual reproductive behaviour is frequently shaped by mistimed or unintended births, which continue to represent a considerable share of total fertility (Mussino *et al.*, 2021). Studying fertility intentions of adolescents could offer valuable insights into the early formation of reproductive goals and attitudes of people, helping policymakers anticipate future fertility trends and identify potential socio-cultural factors influencing them since the young age. Moreover, adolescents' attitudes toward childbearing may inform us about the cultural change going on in the Italian society overall, being their intentions strongly influenced by the experience they had in their family of origin.

This thesis focuses on a specific aspect of fertility, namely the earlier intention to have at least a child. This choice stems from the observation that there is a relevant variability in the survey's answers when confronting girls reporting to be wanting a child to girls reported to be undecided about motherhood, and girls who reported that they do not intend to become mothers in the future. By contrast, among girls expressing to be wanting a child in the future, there is little variability in the answers, and almost all the girls reported an ideal of having two children (Istat, 2024a). Consequently, focusing on intended fertility (the exact intended number of children) rather than on intended childlessness (if girls want a child or not) could lead to less precise results.

Therefore, appears particularly interesting to compare patterns of native and migrant adolescents, given the growing migration flows and the increasing cultural diversity within Italian schools. Understanding how migration background influences the impact of some variables on adolescents' views on childbearing may favour a better understanding of cultural adaptation processes among young generations, providing valuable insights about future demographic trends also in this regard. Moreover, as showed in literature, the fertility preferences of foreigners may vary not only according to shared socio-economic factors with natives, but also according to specific characteristics more strictly associated with migration background, such as their country of citizenship and the time of arrival in Italy, and similar patterns may be reliable also for adolescents.

That stated, this dissertation aims to answer the following research questions:

- **RQ1:** Do adolescents in Italy express a strong intention to have children in their lifetime?
- **RQ2:** Which socio-demographic variables are associated with intended childbearing among adolescents in Italy?
- **RQ3:** Do socio-demographic predictors of intended childbearing differ between Italian and foreign adolescent citizens?

2. Methods

The following chapter begins with a description of the dataset, the sampling design, and the nature and collection process of the data. It then introduces the variables relevant to the analysis, presenting for each of them descriptive statistics to provide an overview of their main characteristics. Distributions of the variables are therefore visualized using appropriate graphical methods: boxplots are employed for numeric-continuous variables, whereas bar plots are used for categorical ones. Each table is further divided into two graphs. The first one depicts how responses are distributed among all girls, counting Italians and foreigners together. The second one, instead, shows the proportions of the two groups within the responses so facilitating a direct comparison between them.

Subsequently, the chapter outlines the analytical strategies adopted. To begin with, a Principal Component Analysis (PCA) was employed to summarize and reduce the dimensionality of the first set of shared variables between migrants and foreigners. Then, to properly examine the effect on all the independent variables on childlessness intentions, a series of multinomial logistic regression models were estimated.

All the computations described above were conducted using the software *"R-Studio"*.

2.1 The Survey "Bambini e ragazzi: comportamenti, atteggiamenti e progetti futuri": Data and Sample

This dissertation uses data from a national survey conducted by the "*Istituto Nazionale di Statistica*" (Istat) from 1st October to 20th December 2023 called "*Bambini e ragazzi: comportamenti, atteggiamenti e progetti futuri*", collecting information on several fundamental aspects of the daily lives of boys and girls residing in Italy (Istat, 2024a). Young people included in the sample were asked to complete a short online questionnaire, also accessible via smartphone, composed by simple questions regarding relationships with friends and family, the use of social media, education, citizenship and sense of belonging, as well as their future plans (Istat, 2024a). Adolescents and their families received, by mail at their home address, an informational letter signed by the President of Istat containing details about the survey and the instructions needed to access the questionnaire (Istat, 2024a). The letter was addressed directly to the students if they were of the legal age of 18 years old, or to the family if the student was a minor (Istat, 2024a). Letters addressed to students were available, beside Italian, in Albanian,

Arabic, Chinese, French, English, Romanian, Russian, Slovenian, Spanish, and German (Istat, 2024a). The questionnaire could also be completed via smartphone through a QR code included in the Istat communication and available in Albanian, Arabic, Chinese, French, English, Romanian, Spanish, German, and Ukrainian, beside Italian (Istat, 2024b).

The questionnaire is structured into eight sections: a) "*Who are you*?", collecting questions about several personal characteristics of the respondents and their families, b) "*School and study*", which includes questions about the respondents' current and future educational paths, c) "*Citizenship and identity*", which includes questions concerning perceptions of integration and personal identity, d) "*Social relationships*", including questions concerning relationships with their peers, e) "*Leisure time*", which includes questions related to their habits and free time f) "*Your future*", which includes questions relative to their future, including inquiries about childbearing intentions, g) "*Opinions on men and women*", collecting questions about their perceptions of gender differences, h) "Other information" (Istat, 2024b). Particular attention has been devoted to adolescents with a foreign citizenship, as one of the survey's aims was to assess the degree of integration of migrant adolescents within the Italian society (Istat, 2024a).

Approximately 108,000 boys and girls between Italians and foreigners aged 11 to 19 and residing in Italy were invited to participate in the survey (Istat, 2024a). A total of (N = 39,214) adolescents participated in the survey (Istat, 2024a).

2.1.1 Dependent and Independent Variables

Considering only female respondents, the dataset is reduced to (N = 18,982) observations. The final analytical sample used for the analysis, however, includes only (N = 4,557) cases. The highlighted massive decrease in the number of the total observations is because for some variables other selection criteria have been employed. The exact rationale for each variable will be justified and explained step-by-step below.

Citizenship is the first variable to consider, as it consents to clearly distinguish who exactly are the "Italians" and the "Foreigners". Specifically, and for the scope of this thesis, the discriminant characteristic is the Italian citizenship. Thus, students with Italian citizenship are classified as Italians, while those without it are classified as Foreigners. The distinction between the groups is based on the survey question: *"Do you have an Italian citizenship?",* to which students could respond either *"Yes"* or *"No"*.

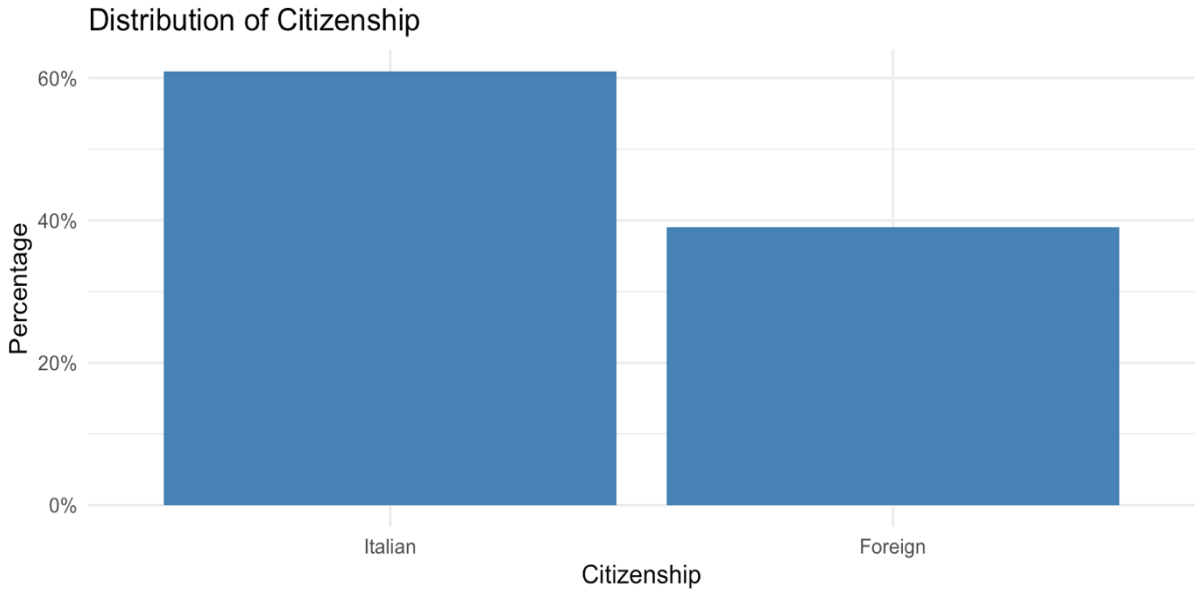

Figure 2: Female adolescents aged 11-19 years by citizenship status. Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

As *Table 2* shows, among the total sample of girls, Italians account for 60.93%, while foreigners make up 39.07%. Building on this proportions, the distributions for the other variables will highlight any potential imbalances between the two groups.

Expected Childlessness is the dependent variable. As regard this variable, the survey asked a straightforward question: "*When you grow up, would you like to have children?*". Respondents could choose among four options: "*Yes*", "*No*", "*I have never thought about it/I don't know*", and finally "*I already have children*". For the analysis, the latter option has been deleted, as including girls who already have a child would not allow to properly study future fertility intentions. When it comes to include or not the undecided girls, representing the 10.77% of the total answers, the matter is heavily different. The category "*I do not know*" is usually considered to have a different meaning from the ones representing "*Yes*" and "*No*", and in this case the number of girls who have responded that they do not intend to have a child in the future is even lower than the undecided ones, representing the 5.57% of the total distribution. The girls reporting to desire a child in the future represents instead the majority of the observations (83.65%). This early observation allows to answer to the first research

question; it would be reasonable to conclude, in fact, that childbearing is still a widely supported choice among young people.

Given these overall distributions, it becomes particularly interesting to examine whether fertility intentions differ between Italians and migrants, and preliminary observations would suggest that the proportion of the responses for all categories may vary across these two citizenship groups. Particularly, foreigners are slightly overrepresented within the categories "*No*" and "*I do not know*", scoring respectively 40.94% and 40.32%, and slightly underrepresented within the category "*Yes*", scoring 38.77%. Of course, the opposite holds for Italians, that are instead moderately overrepresented within the category "*Yes*" and underrepresented within the categories "*No*" and "*I do not Know*". In other words, in proportion and net of controlling variables, Italian girls tend to express a stronger intention to have at least a child in the future, whereas foreign girls are more likely to be uncertain or to report that they do not intend to have children. This observation contradicts what is commonly found in the literature, namely that migrants tend to exhibit higher fertility levels and lower rates of childlessness compared to locals.

All the characteristics mentioned above as regard the variable *expected childlessness* could be summarized as follows:

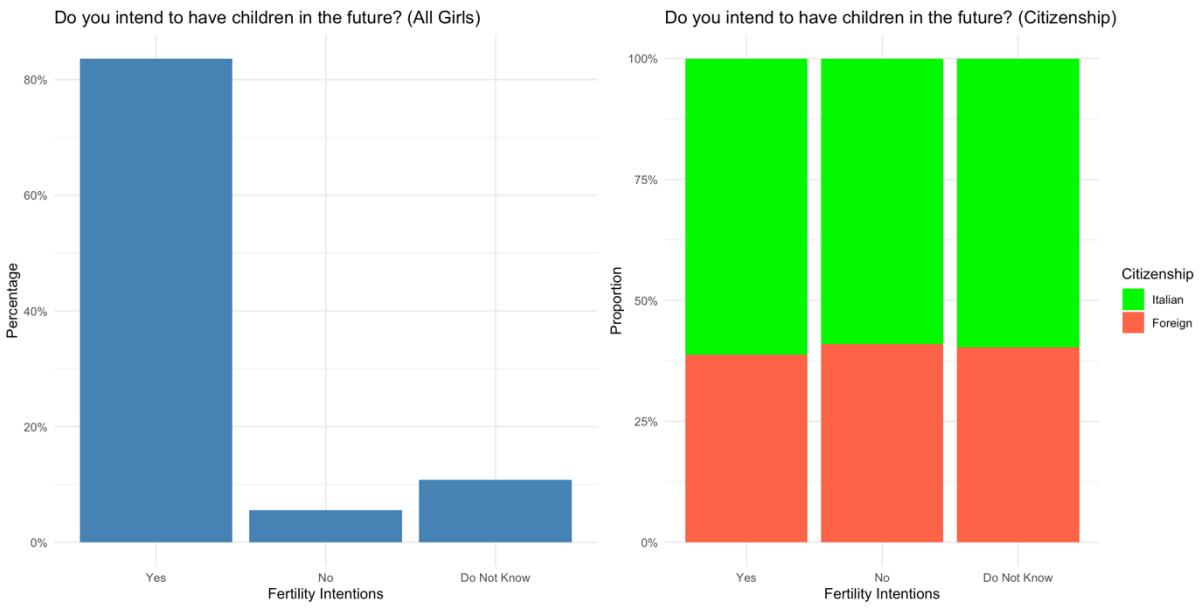

Figure 3: Female adolescents aged 11-19 by fertility intentions (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

Education is the first independent variable, for which the survey asked the question: "*Which school are you attending?"* Respondents could choose among the options "*Elementary*", "*Middle School*", "*High School*", "*Technical Institute*", "*Professional Institute*", "*University*". For the scope of the analysis, respondents attending "*Elementary School*" and "*Primary School*" were excluded, as girls at these educational stages are generally considered too young to have fully formed fertility intentions. Including them could introduce noise into the analysis, since their responses might not reflect genuine intentions. Respondents attending "*University*" were also excluded, as only students currently attending secondary school were asked about their plans after the diploma, for instance whether they intend to pursue higher education or enter immediately the workforce. Including university students would not allow us to assess the different impact on fertility intentions of choosing to pursue a higher education versus enter early the job-market, a variable that will be soon analysed. Thus, the analysis focuses than on girls attending a "*High School*", a "*Professional Institute*", and a "*Technical Institute*".

Distributions for this variable could be summarized as follows:

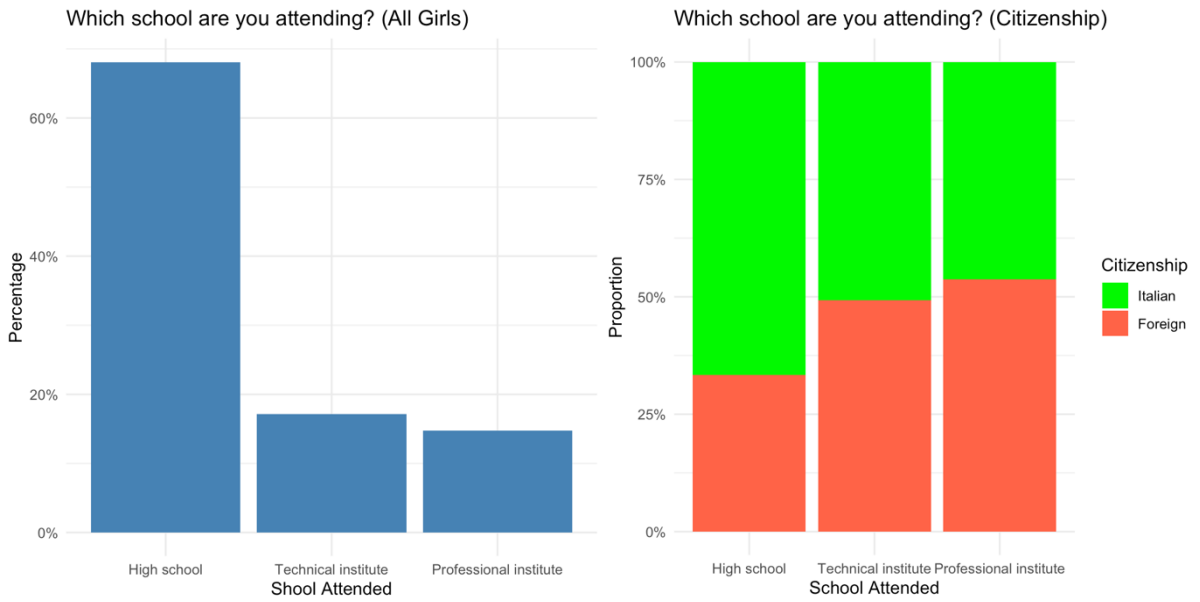

Figure 4: Female adolescents aged 11-19 by type of school attended (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

As shown within the tables, most of the students included in the analysis, the 68.09%, attend high school, whereas the 17.16% is enrolled in technical institutes. Only the 14.74% is

enrolled, instead, in professional institutes. Focusing on the comparison between Italians and foreigners, migrant girls appear markedly overrepresented in both technical and professional tracks, accounting for 49.23% and 53.72% respectively, and conversely underrepresented in high schools, where they constitute only 33.32% of the total distributions.

Expected Employement/Study is the second independent variable. It is heavily relevant especially because allows to give exhaustiveness to any consideration regarding education, since the survey asked the question: "*When you finish secondary school, what do you intend to do?*". Students could choose between the following options: "*Enrol in University*", "*Enrol in other education/training courses*", "*Start working*", "*Other*", "*I don't know*". Including this variable in the analysis makes it possible to account for the exact expected educational attainment, allowing for a more accurate estimation of the effect of education on expected childlessness. In order to obtain a more accurate estimate and avoid noise, the students who answered "*Other*" and "*I do not know*" were excluded from the model.

Descriptive statistics for this variable are illustrated in the following table:

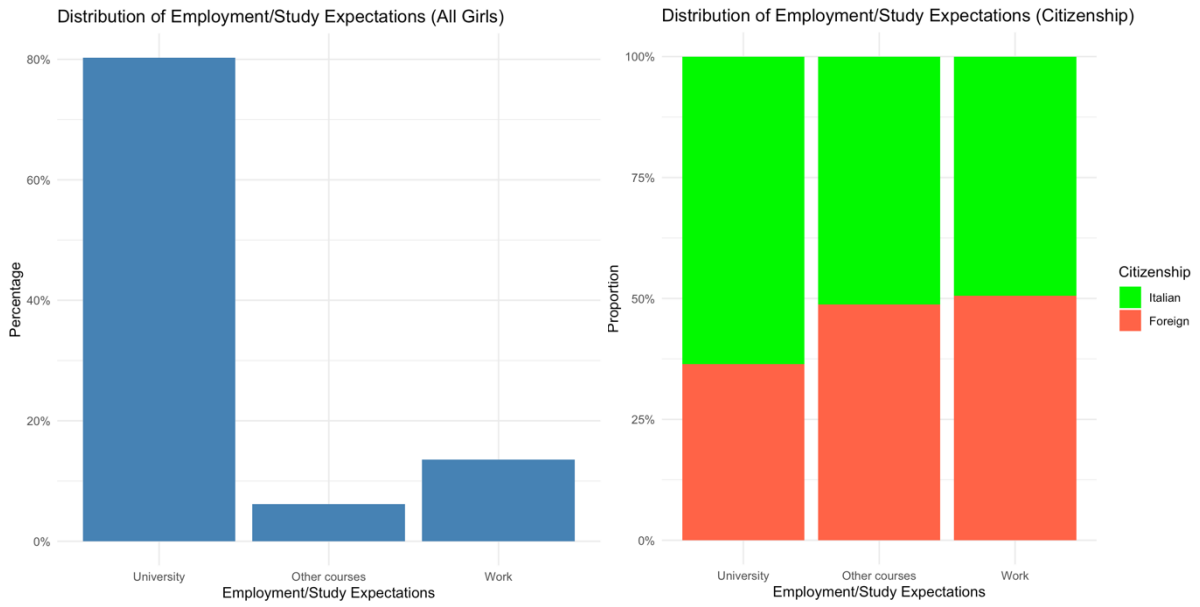

Figure 5: Female adolescents aged 11-19 by study and/or employment expectations after secondary school (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

As shown in the first graph, a large majority of girls intend to enrol in university (80.29%), followed by those who plan to enter the labour market after high school (13.53%). Conversely, the share of girls who expect to enrol in other vocational or training courses is much smaller (6.16%). Regarding the composition of these groups by citizenship, foreign girls are once again overrepresented among those who intend to enrol in *"Other Courses"* (48.76%) and those who plan to enter the labour market directly after high school (50.57%), while they are underrepresented among those planning to attend university (36.38%). Therefore, to conclude on education, descriptive statistics for foreign girls evidence a lower propensity to pursue higher education compared to Italian girls.

To broaden the scope of the domain related to the education of students, another variable renamed *Books Read* has been considered. As regard this measure, the survey asked the following question: "*Within the past 12 months, how many books have you read?*". To answer this questions, students could directly write the precise number of books, making the variable numeric. To facilitate the interpretation, 4 intervals were created; from 0 to 5 books, the value "1" has been assigned, from 6 to 10 books has been assigned the value "2", from 11 to 20 books the value "3", and finally the value "4" from 21 to 50 books.

The distribution of data could be summarized within the following boxplots:

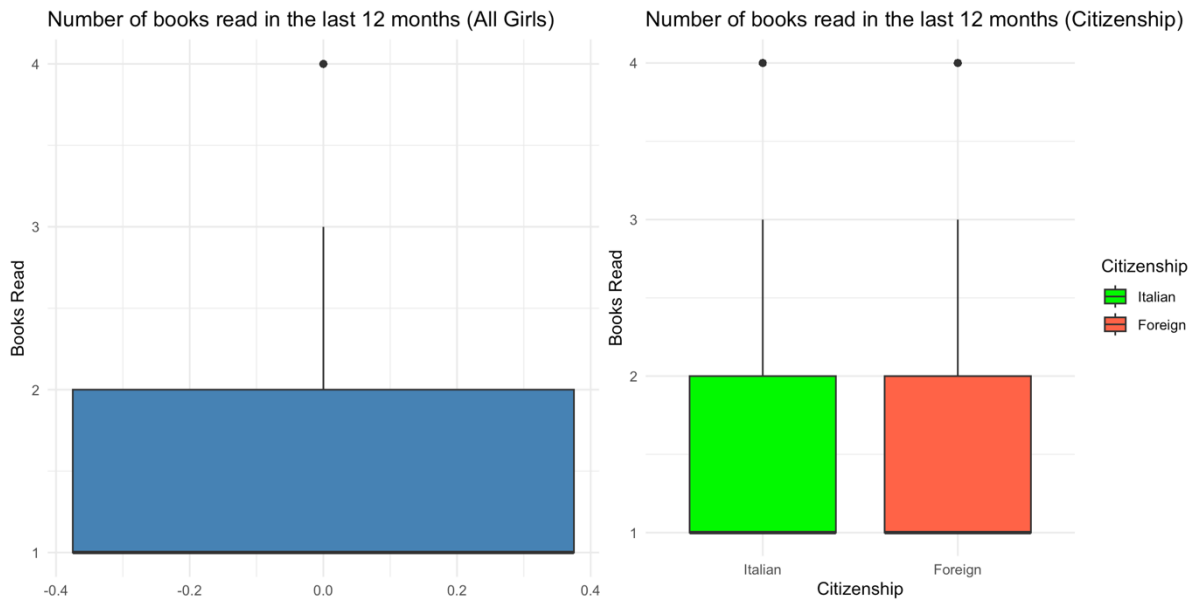

Figure 6: Female adolescents aged 11-19 by mean number of books read in the last 12 months (left) and internal distribution by citizenship (right). Italy. Year 2023.

Source: Author's own elaboration based on Istat's data.

In this case, there are no significant differences between Italians and foreigners. For both groups, in fact, the median is around 1, indicating that at least half of the students have read between 0 to 5 books. Moreover, the interquartile range (IQR) is between 1 and 2, indicating that most people read no more than 10 books. The value 3 (11 to 20 books) corresponds to the upper whisker of the box plot, while the value 4 (20 to 50 books) represents outliers. The mean of the overall distribution is 1.58, while the mean scores for Italians and foreigners considered separately are 1.60 and 1.56, respectively, indicating that, on average, Italian students tend to read more than their foreign peers.

Closely related to the variable capturing the number of books read, another relevant measure to consider is students' enjoyment of reading, summarized by the variable *Like Reading*. As regard this variable, the survey asked the question: "*Do you like reading?*", and students could only choose between "*Yes*" or "*No*".

The answers are distributed as follows:

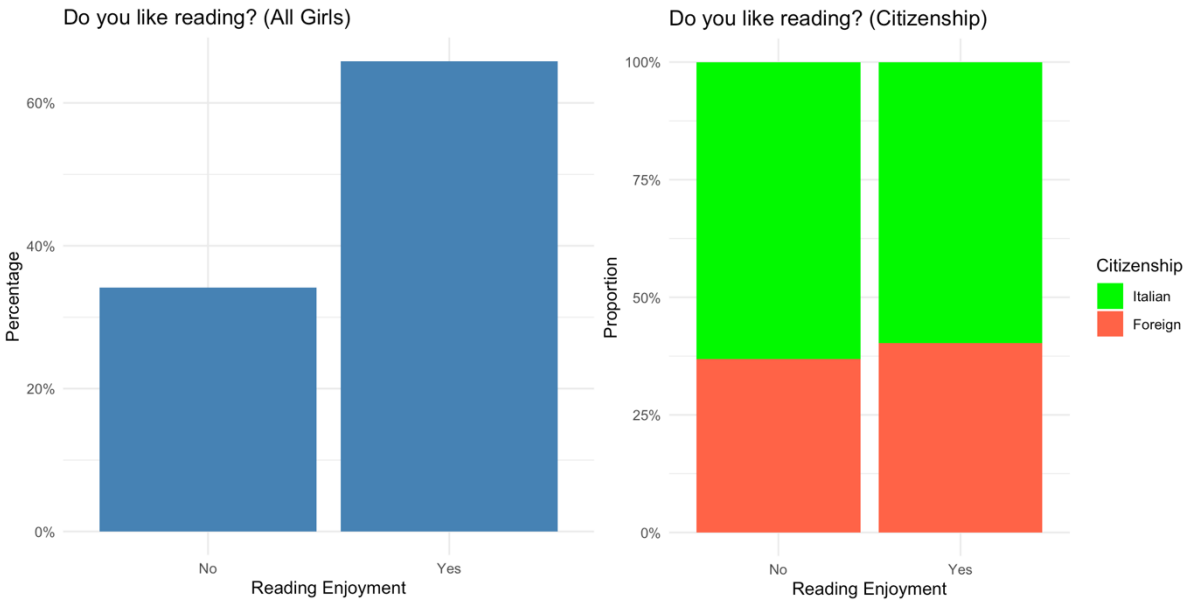

Figure 7: Female adolescents aged 11-19 by reading enjoyment (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

As the table show, the majority of students reported to enjoy reading (65.85%). Regarding the comparison between groups, the distribution is well balanced, with foreigners slightly overrepresented in the "Yes" category. It is worth noting that, although Italian girls reported reading more books, foreign girls stated that they derive greater enjoyment from

reading. Consequently, although being very similar, they may represent two variables with distinct effects in the estimates.

A specific pair of variables assume relevance because allows for a comprehensive understanding of the education domain. They are the *Education of the Father* and the *Education of the Mother.* As regard both variables, the survey asked the following question: "*What is the level of education of your father/mother?*". Students could choose between the following options: "*None*", "*Primary school certificate*", "*Middle school certificate*", "*High school diploma*", "*University degree or PhD*", "I *do not know*". To make interpretation easier, four categories were created for both variables: to begin with, "*None*" and "*I don't know*" were put together and correspond to the category number 1, to the categories "*Primary school certificate*" and "*Middle school certificate*" has been assigned the number 2, for "*High school diploma*" number 3, and number 4 has been assigned to "*University degree or PhD*".

Within the following plots the two variables are summarized:

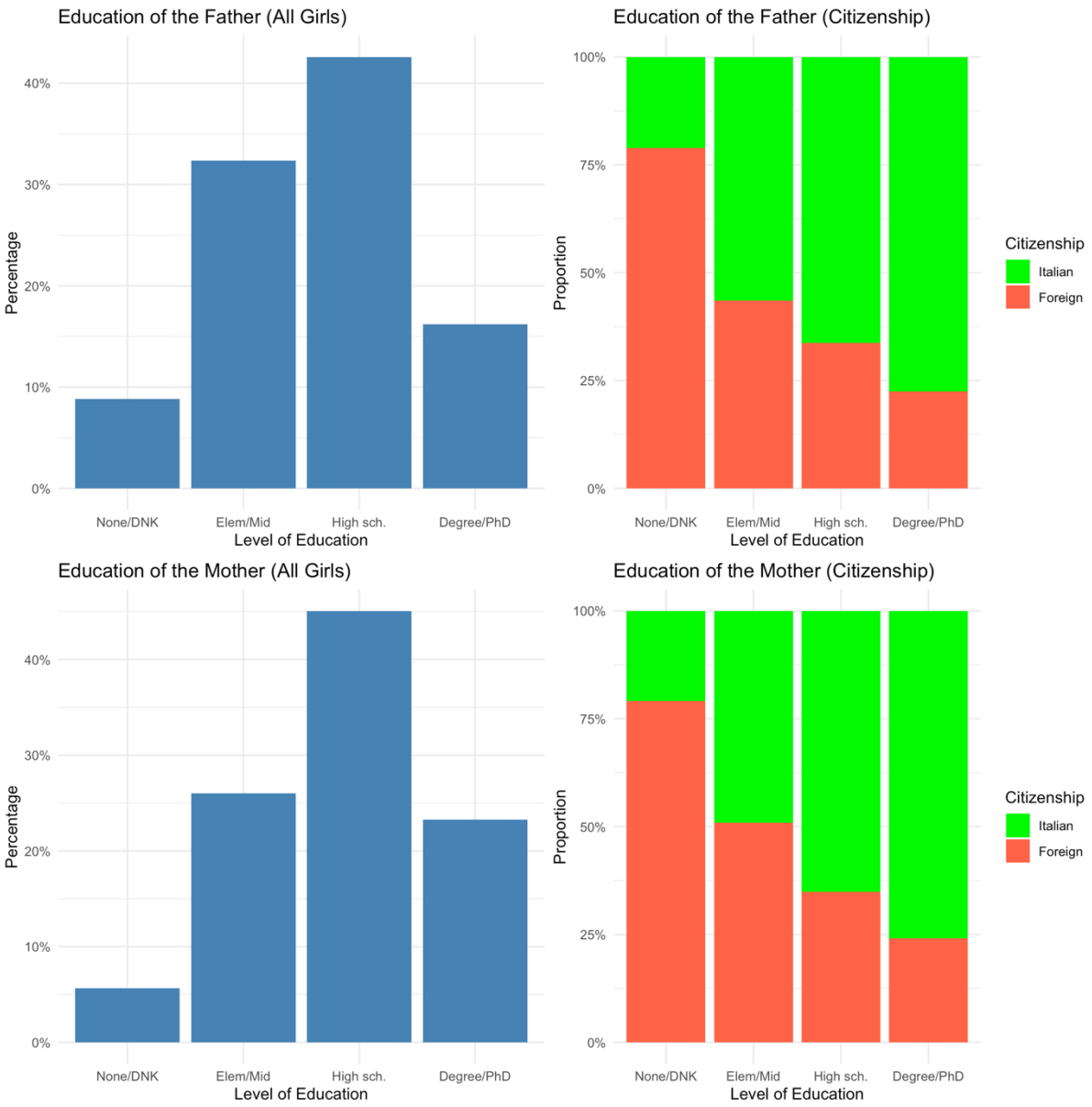

Figure 8: Female adolescents aged 11-19 by father's and mother's education (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

As regard mothers, only the 5.66% of girls reported no education or did not know the education level of their mother, whereas the 26% reported elementary or middle school (26.00%). The largest group reported high school diploma (45.07%), and the 23.26% indicated a university degree or PhD (23.26%). Fathers follow a similar distribution, except for lower levels of education. 8.84% of girls reported no education or did not know what to answer, whereas the 32.35% of the fathers were indicated to have completed elementary or middle school. The category "High school" is, once again, the most reported one with a percentage of

42.59%, whereas the 16.22% of fathers were reported to have a university degree or PhD. As regard the comparison between citizenship groups, differences in the distributions emerge. Migrants, in fact, exceed the 75% in the "*None/DNK*" for mothers and score around 50% for fathers. Thus, migrant students are more likely to come from families with the lowest levels of parental education. Moreover, migrants account for over 50% in the "*Elem/Mid*" category for mothers' education, whereas for fathers' education the distribution is more balanced, but still evidencing overrepresentation (43.55%). Thus, migrant students are more likely to come from families with the lowest levels of parental education. Finally, as regard fathers with a high school diploma, migrants represent 33.69%, and for mothers 34.90%. Similarly, in the university degree and PhD category, migrants account for 22.46% of fathers and 24.15% of mothers, showing a scarcer representation. Parental education of both the mothers and the fathers was treated as a numeric and ordinal measure. Thus, increasing numeric values were assigned as follows (1 = "*None/I do not Know"*, 2 = "*Elementary/Middle school certificate*", 3 = "*High school diploma*", 4 = *University degree/Ph.D.*") to the education categories, reflecting ascending levels of educational attainment.

With the variable *Marriage*, the focus shifts from the educational domain to one more closely related to personal values. This variable captures students' views on marriage, which may have an influence on their intention to remain childless. As regard this variable, the survey asked the following question: "*Do you expect to get married in the future?*". In addition to "*Yes*" and "*No*", the responses also include a category "*I Do not know*". All the three categories were retained for the analysis. It is important to note that, prior to this question, the survey asked students whether they intended to live as a couple. Only those who answered "*Yes*" were allowed to respond to the subsequent question on marriage. Consequently, students who stated that they do not plan to live in a couple were excluded from the analysis. Doing so ensures a specific focus on the effect of marriage versus non-marriage or indecision on the dependent variable.

Below, the graphs summarizing the distributions for this variable:

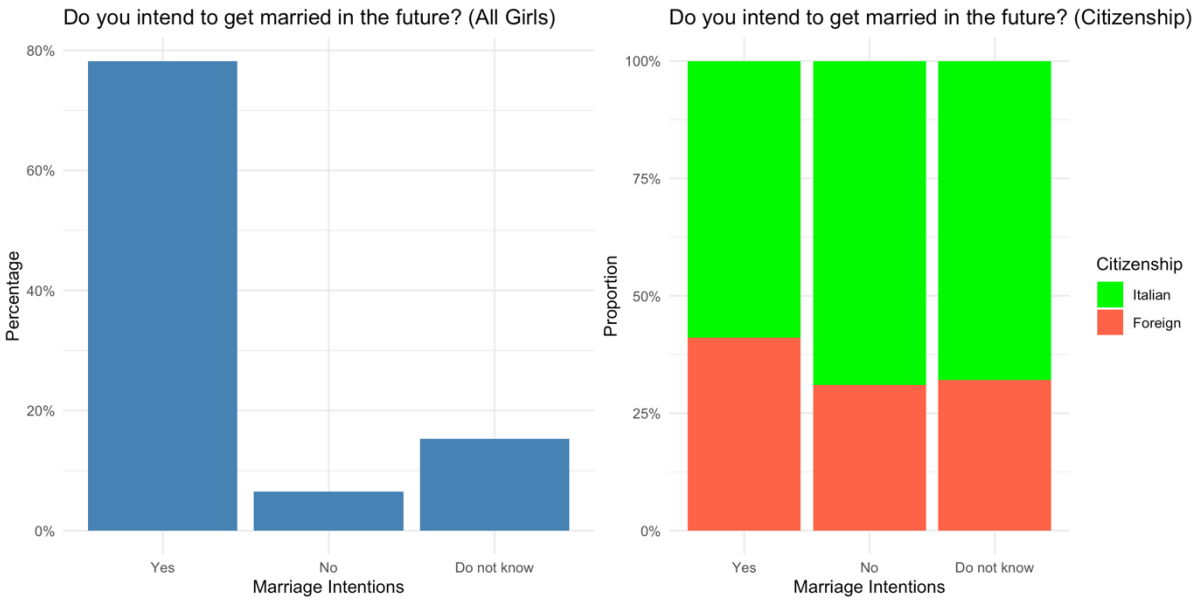

Figure 9: Female adolescents aged 11-19 by marriage intentions (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: author's own elaboration based on Istat's data.

As the table shows, the 78.23% of students reported that they would like to get married in the future. A smaller minority (6.52%) declared instead that they would not intend to marry, whereas the 15.25% reported to be unsure about it. These observations partially confirm the initial expectations, and marriage confirms itself to be a widely supported life choice in Italy. Nevertheless, a notable share still expresses uncertainty. Moreover, the 41.09% of those who answered "*Yes*" were foreign students, indicating that foreign students show a stronger preference toward marriage compared to Italians. By contrast, foreigners account for 30.97% of the "*No*" responses and 33.52% of the "*Do not know*" responses, indicating instead underrepresentation in both categories.

Another variable that could play a role in shaping fertility intentions of adolescents is the *Income of the Family.* This measure, in fact, represents a crucial component of individual social capital and could potentially be linked to other variables. As regard this variable, the survey asked the question: "*How would you define the economic situation of your family?".* Students could choose between the following options: "*Not good at all", "Not very good*", "*Fairly good*", "*Very good*". To facilitate the interpretation, the first two responses were incorporated in a single category named "*Not good*".

The answers of the students are distributed as follows:

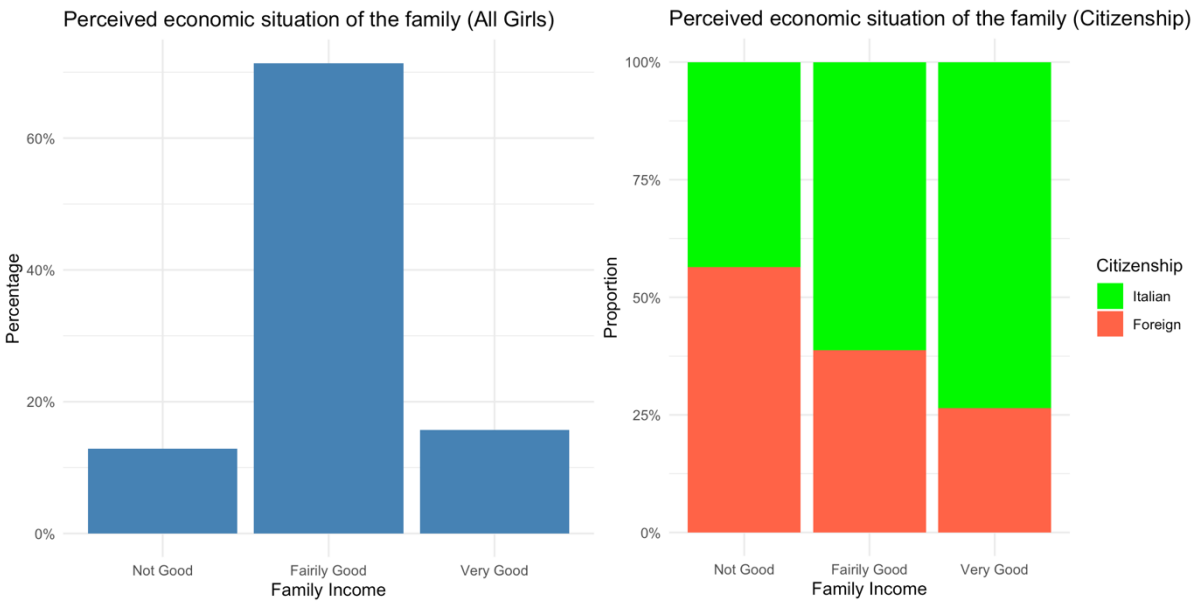

Figure 10: Female adolescents aged 11-19 by perceived economic situation of the family (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

As it can be seen from the table, the majority of girls (71.38%) consider their familiar economic situation to be "*Fairly good*." A smaller share (12.90%) reported it to be "*Not good*," whereas the 15.71% describe it as "*Very good*." Notable differences between the groups are present. Among girls reporting "*Not Good*", migrants represent the majority, accounting for more than half of the total distribution (56.46%). This indicates that a perceived economic disadvantage is more prevalent among foreign students, being migrants heavily overrepresented in this category. This observation is particularly interesting, as attituded toward the future and the perceived familiar economic situation follow very different distributions. Particularly, despite migrants reported to live in harsher economic conditions, they show more positive attitudes toward the future. Within the "*Fairly Good*" category, the distribution is more balanced (38.70%), whereas within the "*Very Good*" category the Italian group dominates. Migrants faces, in fact, a heavy underrepresentation (26.39%). For this variable as well, perceived family income was treated as an ordinal measure by assigning increasing numeric values to the categories (1 = *"Not good"* 2 = "*Fairly good",* 3 = *"Very good"),* reflecting, in this case, ascending levels of perceived economic well-being.

Since psychological research suggests that family structure plays a role in shaping children's fertility intentions, the number of *Family Components* has also been considered. As regard this variable the survey asked the question: "*How many people are in your household counting yourself?*". As happened for the number of books read within the last year, students could write down the exact number of household members. To facilitate interpretation, three intervals were created: one grouping values between 2 and 3, a second interval collecting all values equal to 4, and a final category including values of 5 or more.

The variable is summarized within the following plots:

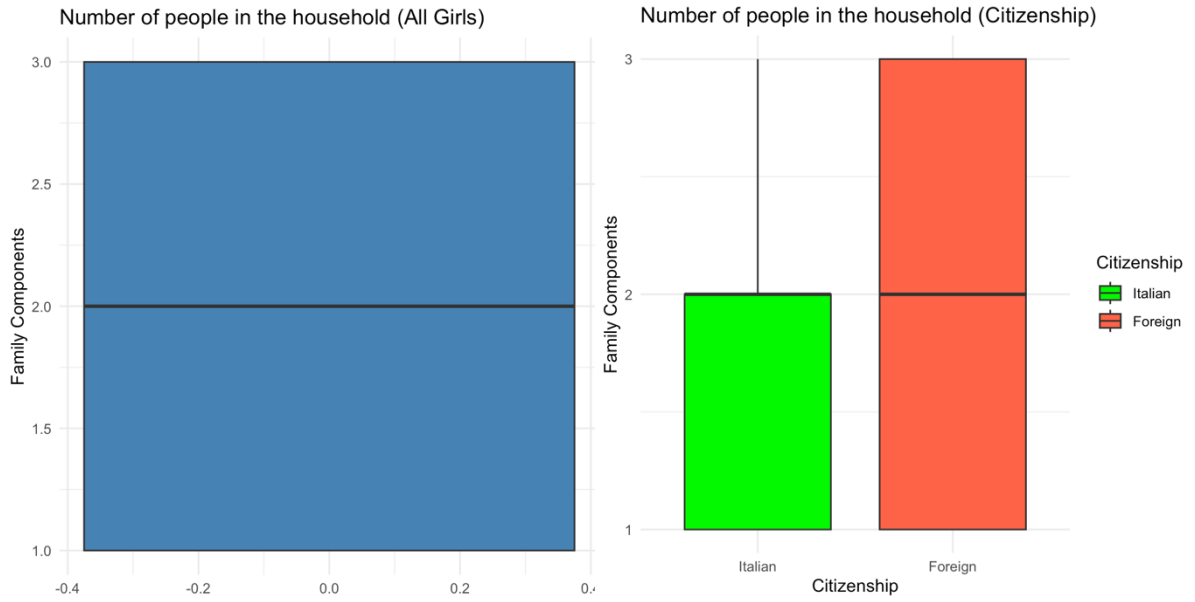

Figure 11: Female adolescents aged 11-19 by mean number of family components (left) and internal distribution by citizenship (right). Italy. Year 2023).

Source: Author's own elaboration based on Istat's data.

In this case, differences between Italians and foreigners emerges. Although the median is around 2 for both groups, indicating that at least half of the students come from households composed by 2 to 5 members, the spreads differ. For Italian families, the IQR ranges from 1 to 2, indicating that most Italian families include between 2 and 4 members. For foreigners, instead, the IQR is wider, scoring between 1 and 3. Foreign households are indeed more likely to have a larger number of family members. This observation is further supported by looking at the mean values. The average number of family members is in fact slightly higher among foreigners (2.08) than Italians (1.98), indicating that foreign households tend to be larger on average.

The survey also asks students questions related to their perceptions as regard the future, which may influence fertility outcomes because they may be linked with a perceived sense of insecurity. *Expected Future* should therefore be considered in the analysis. The question posed was: "*Which of the following statements regarding the future represents you the most?*". Students could choose between the following options: "*The future fascinates me*", "*The future scares me*", "*I don't think about the future*", "*I don't know*". To avoid noise in the analysis, students who indicated being indifferent toward the future or who did not know what to answer were excluded. Therefore, the analysis focuses only on students who are fascinated or scared by the future.

Responses are summarized within the following graphs:

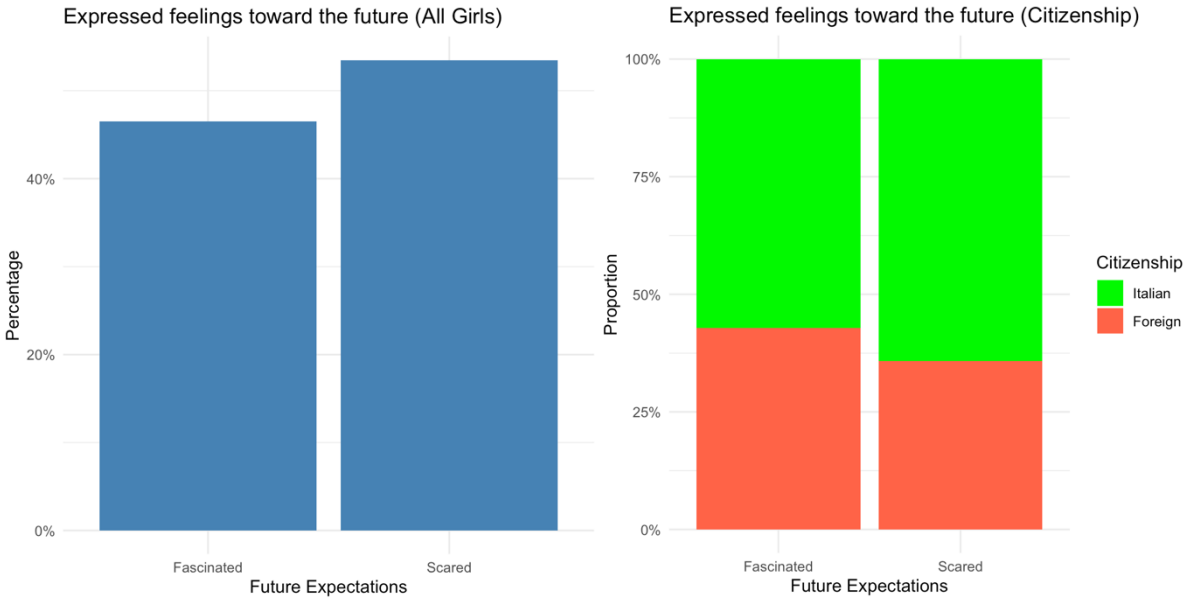

Figure 12: Female adolescents aged 11-19 by perceptions about the future (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).
Source: Author's own elaboration based on Istat's data.

As it can be seen within the tables, among all students, the 46.52% feel fascinated by the future, while 53.47% feel scared, indicating a slight general tendency toward be fearful. As regard the comparison between groups, instead, foreign students are slightly overrepresented among those reporting to be fascinated by the future, making up 42.78%, and underrepresented among those scared of it, accounting for 57.22%. We can conclude that foreign students, contrary to the expectations and the literature, hold, on average, a more optimistic outlook toward the future than Italians do.

Although all selected students attend secondary school, namely the Italian "*Scuola Secondaria di Secondo Grado*", *Class Age* must also be considered, as students of different ages may have varying levels of maturity which can influence their future fertility intentions. Regarding the measure, the survey classified students into two age groups: the first included those aged 11 to 13, whereas the second comprised students aged 14 to 19.

The following tables summarize the distribution for this variable:

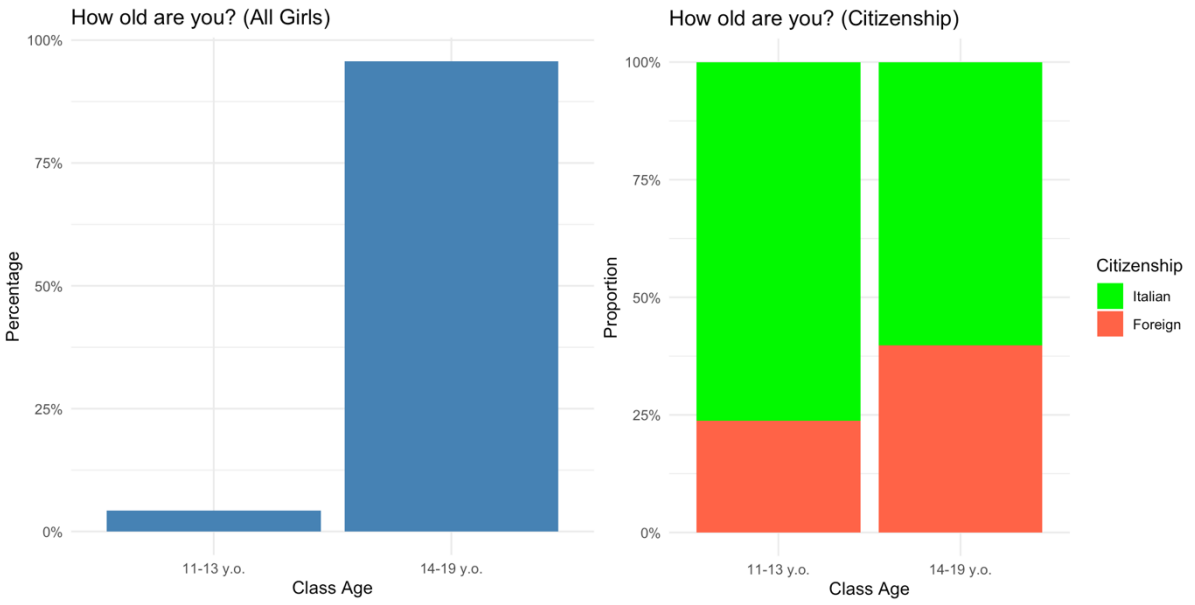

Figure 13: Female adolescents aged 11-19 by age breakdowns (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).
Source: Author's own elaboration based on Istat's data.

As the tables show, almost all the students are aged between 14 and 19 years old, representing the 95.74% of the total distribution, whereas only the 4.25% is aged between 11 and 13 years old. Migrants are therefore underrepresented within the younger group (23.71%), whereas the older group (39.74%) shows a more balanced representation. For the analysis, also the variable accounting for the age of the adolescents has been converted into a numeric dimension. In the specific, the mid-value of each category has been assigned: 12.5 for the 11–13 age group and 16.5 for the 14–19 age group. This allows the variable to be treated as numeric without losing the the relative order of the age classes.

Among the questions on the future, another interesting variable concerns *Expected Migration* patterns, measured through the question: *"Where do you want to live in the future?"*.

Respondents could choose between the following options: *"In Italy"*, *"Abroad where my mother/father was born"*, *"Abroad in a different country"*, *"I do not know"*. To simplify the distributions and reduce noise in the results, the two response options referring to living abroad were combined into a single category labelled *"Abroad"*.

The distribution for this measure is summarized by the following tables:

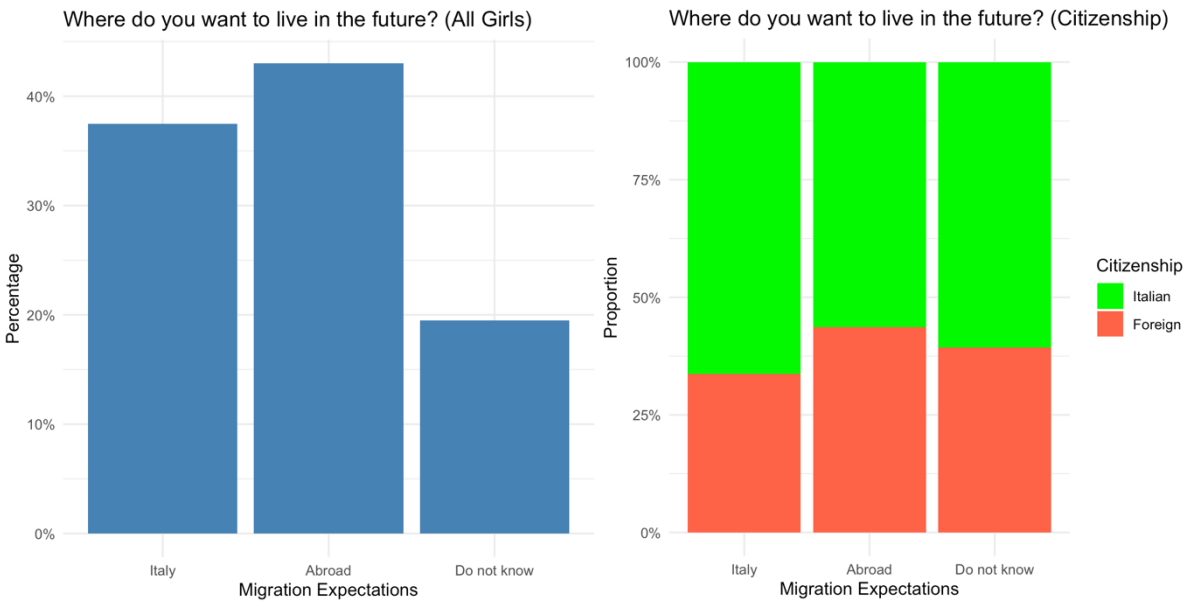

Figure 14: Female adolescents aged 11–19 by intended place of residence in the future (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

The distribution shows that the largest share of respondents intends to live abroad in the future (43.03%), followed by those who plan to remain in Italy (37.48%). A smaller proportion of students (19.49%), instead, reports uncertainty about their future place of residence. As regard the comparison between locals and migrants, the table indicates different patterns. In the specific, foreign students face underrepresentation among students who intend to stay in Italy (33.6%), while, unsurprisingly, are more strongly represented among those who plan to live abroad (45.65%). Indeed, foreigners seem to be inclined toward mobility and less oriented toward remaining in Italy. Among whom reported to be uncertain about their future place of residence, instead, foreigners account for 39.30%, suggesting a more balanced distribution.

Given that regional differences in fertility and childlessness persist in Italy, as well as cultural differences between the North and Centre-South that might have an impact on it (Aassve *et al.,* 2024), it would be important to take *Regional Repartition* into account. Although the data originally reported students' specific regions of origin, to facilitate the interpretation these were grouped into four broader categories: "*North-East*", "*North-West*", "*Centre*", and "*South & Islands*".

Students are distributed within the regional macro-areas as follows:

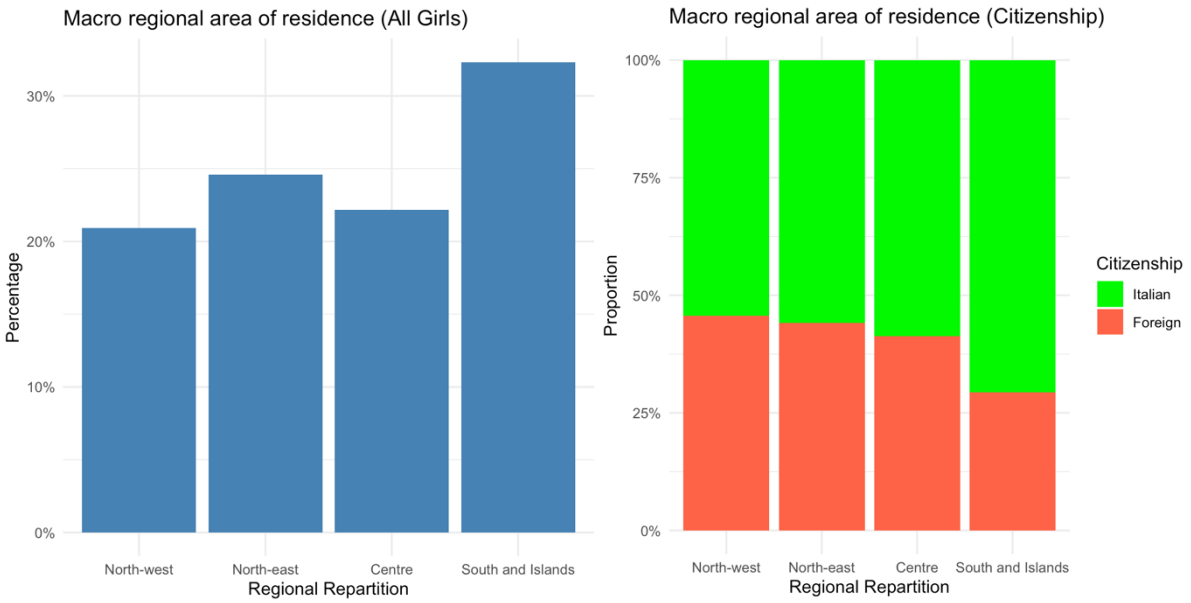

Figure 15: Female adolescents aged 11-19 by geographical area (left) and internal distribution by citizenship (right). Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

By looking at the charts, a clear imbalance across the four macro-areas is highlighted. The South and Islands category represents the largest share of students (32.3%). The North-East follows with 24.6%, and the Centre accounts for 22.2%, both showing substantial but a more moderate representation. The North-West is the least represented group, scoring 20.9%. As regard the comparison between groups, migrants are found to face overrepresentation in the North-West (45.7%), North-East (44.1%), and Centre (41.3%), suggesting a higher concentration in these regions, whereas their proportion in the South and Islands is only 29.4%.

The last two variables to consider apply only to migrant students: *Time of Arrival*, which indicates how long migrant students have been living in Italy, and *Country of Citizenship*, which specifies the country of which they hold citizenship. Regarding the first

variable, it was created by combining responses from two different questions from the survey. The first question asked the respondents about the place where they were born, with options "*Italy*" or "*Another country*". The second question has been asked only to students who reported to be born in another country and was "*When did you arrive in Italy?"* with response options ranging from "*Before 2013*" to each year from 2013 to 2023. By combining the responses from these two questions, a new variable, "*Time of Arrival",* was created. The variable is composed by the following categories: "*Born in Italy*," "*Before 2013*," "*Between 2014 and 2017*," and "*Between 2018 and 2023*". Although this variable is not continuous, numeric values (1 = "Born in Italy", 2 = "*Before 2013*", 3 = "*Between 2014 and 2017*", and 4 = "*Between 2018 and 2023*") were assigned to the categories to preserve the inherent order of the responses. This allows the variable to be treated as ordinal in the analysis, as happened for parental education and family income.

The following table shows the distribution for the created variable:

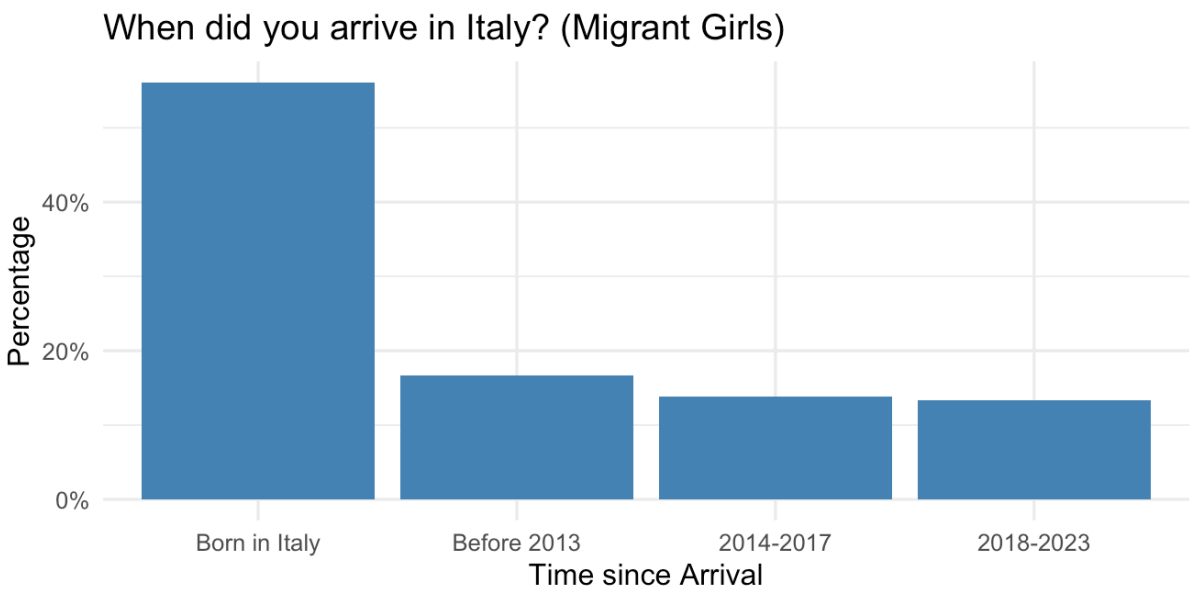

Figure 16: Female foreign adolescents aged 11-19 by time since arrival in Italy. Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

As the table shows, a consistent majority (56.1%) was born in Italy. The largest group of foreign students born abroad (16.6%), instead, reports to have a long-term presence in Italy since before 2013. Students who report to be arrived more recently are half-split; the 13.9% arrived between 2014 and 2017, and 13.4% arrived between 2018 and 2023.

Finally, for the *Country of Citizenship* variable, the survey asked foreign students, namely those who indicated that they hold a citizenship other than Italian, to indicate their specific citizenship, offering the options: "*Albanian*", "*Romanian*", "*Ukrainian*", "*Chinese*", "*Moroccan*", and "*Other*".

Foreign students are distributed as follows:

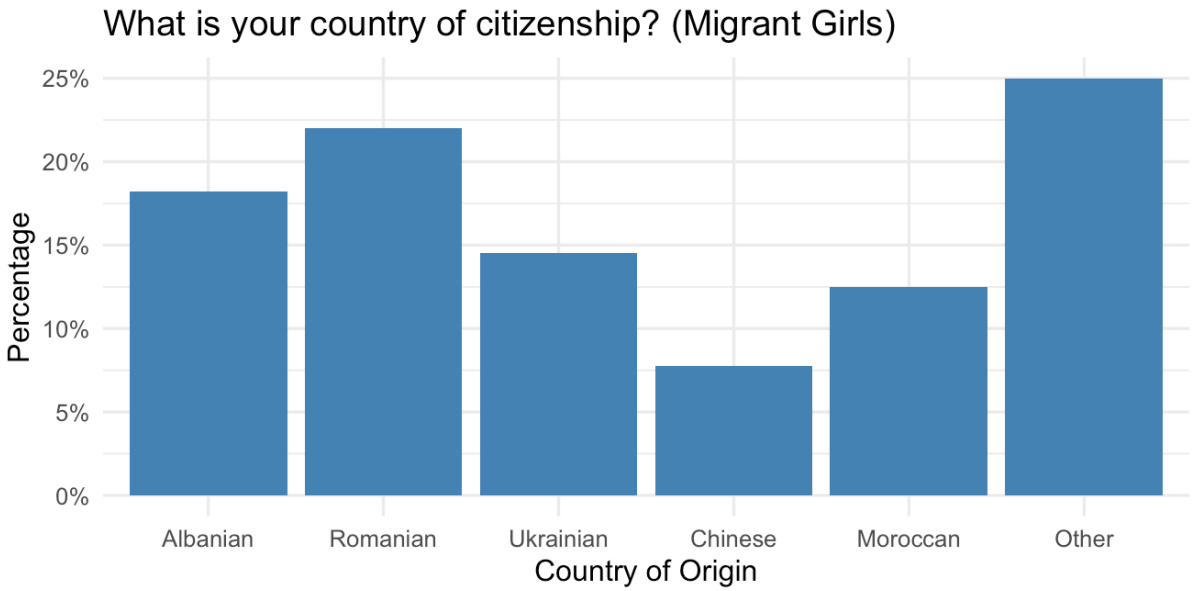

Figure 17: Female foreign adolescents aged 11-19 by country of origin. Italy. Year 2023 (Values in per cent).

Source: Author's own elaboration based on Istat's data.

As the table suggests, the distribution of citizenships shows a substantial heterogeneity among foreign students. Romanian students represent the largest group (22.0%), followed by Albanian students (18.2%), Ukrainian students (14.6%), and Moroccan students (12.5%). Chinese students (7.8%) represent a smaller share. Finally, the *"Other"* category, collecting the students indicating a country not listed by the survey, accounts for 25%.

2.2 Two-step Analysis: PCA and Logistic Regression

To adequately address the two research questions, this dissertation employs a two-step analytical strategy. The first step aims to eliminate redundancy, enhance computational

efficiency, and facilitate data interpretation, while reducing correlations among the many selected independent variables (Geekforgeeks.org, 2025). To achieve this goal, a Principal Component Analysis (PCA) has been performed. PCA is a statistical technique that is frequently used in literature for reducing the number of variables in a dataset, while preserving the most relevant information (Geekforgeeks.org, 2025). It does so by transforming a set of correlated variables into a smaller number of uncorrelated components that still explain a sufficient amount of variance (Geekforgeeks.org, 2025). Doing so allows to simplify the structure of excessively complex datasets in exchange for a small and acceptable loss of information (Geekforgeeks.org, 2025). Usually, to determine the exact number of components to retain, a cumulative variance threshold is applied. Indeed, a specific value called "cumulative proportion of variance", that represents the percentage of variance explained by the components, is calculated. Only the components needed to reach a chosen threshold, commonly between 80% and 90%, are kept for the analysis. This ensures that most of the information in the original dataset is preserved, whereas the dimensionality of variables is reduced.

The table below presents the results obtained after performing the PCA in R-Studio:

```
Importance of components:
                          PC1     PC2    PC3     PC4     PC5     PC6     PC7     PC8     PC9    PC10
Standard deviation     1.8069 1.46919 1.3793 1.31066 1.25463 1.16877 1.15373 1.13928 1.12487 1.09799
Proportion of Variance 0.1306 0.08634 0.0761 0.06871 0.06296 0.05464 0.05324 0.05192 0.05061 0.04822
Cumulative Proportion  0.1306 0.21694 0.2930 0.36174 0.42471 0.47935 0.53259 0.58451 0.63512 0.68335
                          PC11    PC12    PC13    PC14    PC15    PC16    PC17    PC18    PC19
Standard deviation     1.08231 1.04548 1.04075 0.99664 0.95649 0.92507 0.88411 0.76616 0.66042
Proportion of Variance 0.04686 0.04372 0.04333 0.03973 0.03659 0.03423 0.03127 0.02348 0.01745
Cumulative Proportion  0.73020 0.77392 0.81725 0.85698 0.89358 0.92781 0.95907 0.98255 1.00000
                            PC20      PC21      PC22      PC23      PC24      PC25
Standard deviation     6.146e-14 7.018e-15 2.795e-15 2.246e-15 2.142e-15 4.696e-16
Proportion of Variance 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
Cumulative Proportion  1.000e+00 1.000e+00 1.000e+00 1.000e+00 1.000e+00 1.000e+00
```

Table 1: Results of the Principal Component Analysis.

Source: Author's own elaboration based on Istat's data.

As can be seen, the system returns a number of principal components equal to the number of variables, which in this case is 25. The number of variables increased because all the categorical variables were necessarily transformed into "0, 1" dummy variables, as they could not be included as independent variables in their original form in the PCA, which only accept numeric dimensions. These include *Education*, *Expected Employement/Study*, *Like Reading*, *Regional Repartition*, *Expected Future*, *Expected Migration*, and *Marriage*. Each category composing these variables was therefore transformed into a separate "0, 1" dummy

variable, so increasing the total number of independent variables from 13 to 25. As stated before, keep all the components produced by the PCA, representing linear combinations of the original variables, is unnecessary because a smaller number of components already explains a sufficient amount of variance. Based on the cumulative variance, the first 13 principal components have been kept, which together explain over 80% of the total variance.

The second step is to use the principal components in place of the original variables in a specific model. In this case, a multinomial logistic regression was used. As regard this specific model, it is used to calculate the probabilities of outcomes belonging to multiple categorical groups, while ensuring that all predicted probabilities lie between 0 and 1 (Sciencedirect.com, n.d.a). The model specifies a log-linear relationship between the predictor variables and the log-odds of membership in each outcome category, with parameters estimated through maximum likelihood methods (Sciencedirect.com, n.d.a). As discussed within the previous paragraph, the dependent variable *Expected Childlessness* has more than two non-ordered categories, making standard linear regression inappropriate. In a multinomial logistic regression, instead, one of the outcome categories is chosen as the baseline category, and all comparisons are made relative to it. The estimated coefficients, therefore, represent the effect of the predictors on the log-odds of belonging to each outcome category versus the baseline.

In order to identify the best model possible, four different regressions were estimated, and their AIC values were compared. This value indicates how much information is lost when using a specific model to approximate the true data-generating process (Sciencedirect.com, n.d.b). The model with the lowest AIC is therefore considered to be the best-fitting, as it provides the most efficient balance between accuracy and complexity (Sciencedirect.com, n.d.b).

The first model, scoring an AIC value of 2305.804, simply includes all 13 principal components:

	Intercept	**PC1**	**PC2**	**PC3**	**PC4**	**PC5**	**PC6**	**PC7**
		PC8	**PC9**	**PC10**	**PC11**	**PC12**	**PC13**	
Coefficients								
NO	-3.156	-0.128	0.432	-0.479	0.100	0.017	-0.072	-0.084
NO		-0.033	-0.017	0.025	0.042	-0.325	0.124	
DK	-2.330	-0.167	0.362	-0.375	0.289	-0.001	0.112	0.020
DK		-0.054	0.037	0.030	-0.001	0.022	-0.105	

St. Errors								
NO	0.089	0.040	0.047	0.050	0.053	0.057	0.060	0.061
NO		0.062	0.060	0.065	0.065	0.044	0.076	
DK	0.059	0.031	0.034	0.035	0.037	0.040	0.044	0.047
DK		0.044	0.048	0.046	0.047	0.040	0.051	
Res. Var.:	4249.804							
AIC:	4305.804							

Table 2: Multinomial logistic regression model without interactions. Baseline category "YES".

A second model have been constructed excluding from the first model all the principal components showing a *p-value* greater than 0.05, so evidencing statistical insignificancy. With an AIC of 4287.196, the model shows an improvement in overall fit:

	Intercept	**PC1**	**PC2**	**PC3**	**PC4**	**PC6**	**PC12**	**PC13**
Coefficients								
NO	-3.152	-0.130	0.433	-0.480	0.096	-0.071	0.321	0.134
DK	-2.237	-0.168	0.361	-0.374	0.285	0.114	0.017	-0.104
St. Errors								
NO	0.088	0.040	0.047	0.049	0.052	0.060	0.042	0.078
DK	0.059	0.031	0.034	0.035	0.037	0.044	0.040	0.051
Res. Var.:	4255.196							
AIC:	4287.196							

Table 3: Restricted multinomial logistic regression model without interactions. Baseline category "YES".

Note: only the statistically significant principal components are included.

Within the third model, a single interaction has been introduced. Since one of the purposes of the dissertation, as stated in the second research question, was that of examining potential differences between Italians and migrants, an interaction with the variable "*citizenship*", composed by the categories "*Italian*" and "*Foreign*", was added to the model.

With the addition of the interaction, the model treats Italians as the reference category. By consequence, all coefficients calculated for the interaction terms represent how the effect differs for foreign students relative to Italian students. If the interaction term is not significant, so it has a p-value greater than 0.05, it can be concluded that there is no statistical evidence that the effect of the specific component differs between Italian and foreign students. Conversely, if the interaction is statistically significant, a differential effect between Italians and foreigners is present, and it is quantified by the regression coefficient. This allows the model to isolate and quantify whether the relationship between the predictors and the outcome changes depending on citizenship status, so allowing for an exhaustive answer to the first research question.

With an AIC of 4287.804, the model appears to have slightly worsened in terms of fit:

	Intercept	**PC1**	**PC2**	**PC3**	**PC4**	**PC6**	**PC12**	**PC13**
		PC1*	**PC2***	**PC3***	**PC4***	**PC6***	**PC12***	**PC13***
Coefficients								
NO	-3.366	-0.142	0.457	-0.530	0.015	-0.191	-0.332	0.146
NO		-0.030	-0.039	0.142	0.292	0.197	0.019	0.006
DK	-2.415	-0.169	0.339	-0.382	0.252	0.102	0.022	-0.111
DK		-0.049	0.066	0.047	0.170	-0.029	-0.018	0.038
St. Errors								
NO	0.129	0.054	0.062	0.066	0.070	0.084	0.053	0.106
NO		0.084	0.096	0.100	0.110	0.121	0.090	0.157
DK	0.082	0.042	0.044	0.045	0.048	0.060	0.049	0.070
DK		0.065	0.070	0.073	0.080	0.090	0.084	0.103
Res. Var.:	4223.804							
AIC:	4287.804							

Table 4: Restricted multinomial logistic regression model with interactions with the variable "citizenship". Baseline category: "YES".

Note: Interaction terms are marked with asterisks.

Finally, the fourth and last model was estimated by restricting the interaction terms and retaining only those that were statistically significant. PC13 was excluded from this specification, as it lost statistical significance. With an AIC of 4276.118 this last model resulted to be best. Its interpretation and representation, however, is deferred to the next chapter.

As regard the variables reliable only for migrant girls, performing a PCA has not been necessary, because the independent variables considered are few and not highly correlated between each other. Thus, they can be included directly in the regression model without risking multicollinearity or instability in the estimates. As happened for the other categorical and non-ordered independent variables, also the categories composing *Country of Citizenship* were transformed into separate *"0, 1"* dummy variables, being these categories non-numeric. Each regression coefficient can so be interpreted as the effect of belonging to that specific citizenship category compared to not belonging to it. Two different regression models were then run and their AIC values compared.

The first model, showing an AIC of 1991.355, comprehends all the variables, regardless their level of statistical significance:

	Intercept	**Time of Arrival**	**Albanian**	**Romanian**	**Ukrainian**	**Chinese**	**Other**	**Moroccan**
Coefficients								
NO	-2.711	0.249	-1.512	0.012	-0.476	0.893	-0.839	-0.789
DK	-1.763	0.046	-0.547	-0.281	-0.301	0.245	-0.352	-0.526
St. Errors								
NO	0.197	0.098	0.342	0.186	0.254	0.231	0.233	0.306
DK	0.131	0.072	0.176	0.152	0.186	0.213	0.151	0.206
Res. Var.:	1963.355							
AIC:	1991.355							

Table 5: Multinomial logistic regression model. Baseline category: "YES".

The second model, by contrast, showing an AIC of 1989.254, was restricted to include only the variables that proved to be statistically significant. This specification improved the

model's performance and provided a better overall fit. As happened for the first model taking into account all girls, the interpretation of this second regression model, together with its representation, are deferred to the next chapter.

3. Results

In the following chapter, the results of the analysis are presented and interpreted in detail. The discussion is so organized in two paragraphs. The first paragraph collects a detailed interpretation of the principal components, necessary to provide a clearer understanding of the first part of empirical findings. The results presented within this first section, in fact, will allow to only partially answer to the research questions, analysing the effect of a set of characteristics shared by both Italian and migrant students. The second paragraph, finally, will present the results for the regression including unique characteristics to foreign students, so completing the answers to the initial research questions.

In order to interpret all the regression coefficients, different tables have been reported. Within these tables, the coefficients are indicated as estimates with standard errors in parentheses, while the significance level is indicated through p-values.

3.1 Socio-Demographic Characteristics of Adolescents Aged 11-19

As explained within the previous chapter, for the first regression model only the principal components showing statistical significancy have been retained. These components are *PC1, PC2, PC3, PC4, PC6,* and *PC12*. Just one interaction proved itself to be statistically significant, showing a different effect for the two groups Italians and Foreigners, namely *PC4*. The next step is therefore to interpret the components, each of which represents a specific combination of all the original variables. Each variable contributes to the specific component with a loading, representing a weight between -1 and +1, which indicates the strength of its contribution. Thus, a higher value of the loading means that the variable contributes more strongly to that component. The sign of the loading, instead, positive or negative, shows the direction of this relationship; variables with positive loadings vary in the same direction as the component, whereas variables with negative loadings vary in the opposite direction. In short, the loadings allow to understand which variables are most influential in defining the dimension captured by the component and how they relate to each other. Once interpreted based on the weights and the signs, a label can be assigned to each component to facilitate the readability of the results. To do so, a heatmap has been created to visualize the loadings of the principal components, allowing for a clear identification of which original variables contribute most strongly to each component, facilitating the interpretation of the overall results. Within the

map, the colour blue refers to a positive value, whereas a red colour corresponds to a negative one.

The loadings, and so the variables, are distributed within the components as follows:

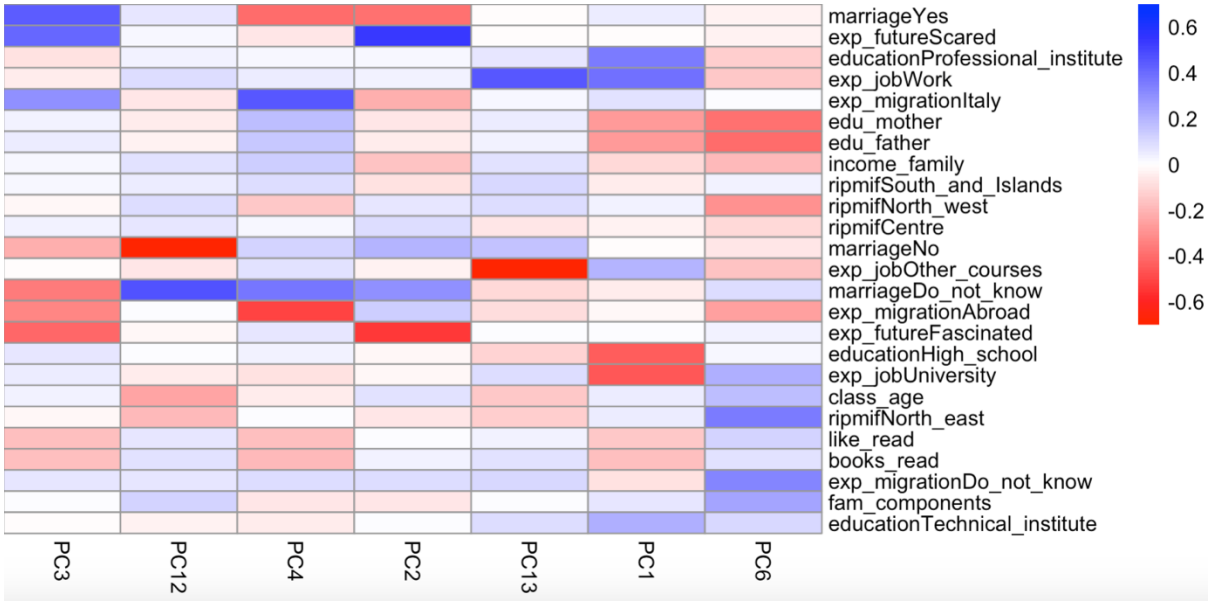

Table 6: Heatmap of principal components' loadings.

Source: Author's own elaboration based on Istat's data.

As shown in the heatmap, *PC1* could be interpreted as representing a dimension contrasting low versus high education. In fact, the attendance of a high school (-0.440) and the expected choice of enrolling in university (-0.454), together with education of the mother (-0.273) and the father (-0.268), load negatively on this component, whereas attending a professional institute (0.353) or a technical institute (0.211) and expecting to enter the labour market early (0.389) or enrol in other professional courses (0.197) load positively. So, considering the signs of the loadings, high school attendance, together with a higher education of both parents, corresponds to a higher probability of pursuing university studies, while professional institute or technical institute attendance corresponds to early labour market entry or enrolment in other professional courses. Accordingly, this first component has been labelled *"Intended Education: Low versus High"*.

As regard *PC2*, it can be interpreted as capturing a dimension that contrasts different visions of the future. As shown within the heatmap, fearing the future loads positively on the component (+0.539), while being fascinated by it loads negatively (−0.539). However, attitudes

toward the future do not represent the only dimensions that shape this component, that is also associated with a positive opinion toward marriage, which loads negatively (−0.381). This suggests that a more positive view of marriage is, in this specific case, linked to a less fearful outlook on the future and opposed to a more fearful one. Taking together these patterns, this component has been labelled *"Scared by Future versus Marriage"*.

Turning to *PC3*, this component again involves attitudes toward the future, particularly being scared (0.413) versus fascinated of it (-0.413), and marriage (0.446). However, in this case, the variable related to marriage displays a positive sign, contrary to what was observed in the previous component. This suggests that the effect of marriage may vary across components, and the effect of the variables could change depending on how they are combined. Specifically, in this case, marriage and future intentions interact differently when they are also linked to specific future migration plans. For this component, marriage is in fact moderately associated with the intention to remain in Italy (0.294), whereas those who plan to move abroad (-0.335) load in the opposite direction (-0.335). Building on the regression coefficients for *PC2* and *PC3*, it will be possible to determine whether the variables defining *PC2* alter their effects depending on how they interact to each other across the different components. This component has been labelled *"Marriage in Italy versus Fascinated by Future Abroad"*.

As regards *PC4*, its interpretation is strictly linked with the previous component. It can in fact be interpreted as capturing a dimension that, another time, contrasts different migration intentions to marriage. As shown by the loadings, marriage exhibits a negative sign (−0.401), the intention to live in Italy loads positively (0.457), and the intention to live abroad loads negatively (−0.517). Thus, this component again connects marriage with migration intentions, but in a different manner, emphasizing the contrast between the intention to stay in Italy and the intention to move abroad, with marriage aligned more closely with the latter. However, in this case, these dimensions so combined are not related to any attitude toward the future as happened for *PC3*. Accordingly, this component has been labelled *"Stay in Italy versus Marriage Abroad"*.

When it comes to PC6, the interpretation is more challenging. It appears to capture a contrast between regional origin, family background, and migration intentions. Students from the North-West (−0.297) with highly educated mothers (−0.390) and fathers (−0.405) tend to have clearer plans regarding migration, whereas students from larger families (0.240) and those from the North-East (0.352) exhibit greater uncertainty about their future place of residence (0.323). PC6 primarily reflects a regional contrast between the Northeast and the North-West, which provides the clearest interpretation of this component. Whereas other variables such as

parental education and family size are involved, the component is best understood through its regional dimension, reflecting a regional contrast between the North-East and the North-West. By consequence, to simplify the interpretation, this component has been labelled *"North-East versus North-West"*.

PC12 is instead easier to interpret and clearly captures a contrast between non-marriage and marriage indecision. Specifically, individuals who do not intend to marry load strongly and negatively on this component (−0.780), while those who are undecided about marriage load positively (0.466). Age class also contributes to this component, albeit to a lesser extent, with older age groups being associated with the choice of not marrying (−0.245). This contrast is particularly interesting because it is suggesting that a negative attitude toward marriage and indecision about marriage may have different effects, thus justifying the decision to treat them as distinct categories. Accordingly, this component can be labelled *"Marriage Indecision versus Non-Marriage"*.

As regard the regression model, results from the analytic approach could so be summarized by the following tables:

Principal Components' Main Interpretation	**Coeff. (St. Err.)**	**P-Value**
PC1: Intended Education: Low versus High	-0.146 (0.041)	< 0.000
PC2: Scared by the future versus Marriage	0.438 (0.047)	< 0.000
PC3: Marriage in Italy versus Fascinated by the Future Abroad	-0.473 (0.049)	< 0.000
PC4: Stay in Italy versus Marriage Abroad	0.028 (0.068)	0.679
PC12: Marriage uncertainty versus Non-marriage	-0.348 (0.043)	< 0.000
PC4 *: Stay in Italy versus Marriage Abroad *	0.265 (0.108)	0.014

Table 7: Restricted multinomial logistic regression with restricted interactions with the variable "citizenship". Outcome category: "NO". Baseline category "YES".
Note: Interaction terms are marked with asterisks.

Component	**Coeff. (St. Err.)**	**P-Value**
PC1: Intended Education: Low versus High	-0.187 (0.032)	< 0.000

PC2: Scared by the Future versus Marriage	0.369 (0.034)	< 0.000
PC3: Marriage in Italy versus Fascinated by Future Abroad	-0.365(0.035)	< 0.000
PC4: Stay in Italy versus Marriage Abroad	0.255 (0.048)	< 0.000
PC6: North-East versus North-West	0.088 (0.044)	0.046
PC12: Marriage indecision versus Non-Marriage	0.023 (0.035)	0.560
PC4 *: Stay in Italy versus Marriage Abroad *	0.163 (0.077)	0.034

Table 8: Restricted multinomial logistic regression with restricted interactions with the variable "citizenship". Outcome category: "DO NOT KNOW". Baseline category: "YES".

Note: Interaction terms are marked with asterisks.

Table 26 reports the results of the multinomial logit model comparing the categories "*Yes*" vs. "*No*", with the first representing the baseline category. *Table 27*, instead, presents a comparison between the categories "*Yes*" and "*Do not know*", with the former set again as the baseline category.

The first component represents *Intended Education: Low versus High*, with low education loading positively and high education loading negatively. This implies that higher values of this component are associated with lower educational trajectories, such as vocational or professional pathways and early entry into the labour market, whereas lower values correspond to higher educational aspirations, such as high school attendance, university enrolment, high education of parents, as seen earlier with the interpretation of this component. The showed negative signs of the regression coefficients indicates that an increase in the principal component is associated with a decrease in the probability of the outcome category under consideration, relative to the baseline category. Thus, a lower education is, in this case, associated with a lower probability of answering both "*No*" and "*Do not Know*" compared to *"Yes".* Conversely, girls with higher education have the same magnitude of effect but in the opposite direction, showing lower odds of choosing "*Yes*" over "*No*" and "*Do not know*".

For the selected of adolescents, a positive relationship between childlessness and education is reliable. However, it is not possible to assess with certainty if adolescent girls prematurely perceive higher educational attainment as less compatible with family formation, thereby reflecting a perceived difficulty in conciliate the two. If this is the case, such a dynamic may reasonably be fostered by the fact that Italy has scarce family policies and weak state-support to childbearing, contributing to maintain traditional representations of motherhood that possibly influence future generations' attitudes. Alternatively, it may simply be the case that more highly educated adolescents share post-materialistic values and prioritize their education trajectories, thereby reporting childlessness intentions more frequently. Furthermore, it is important to note that, since the interaction with the variable *citizenship* is not significant, there is no statistical evidence supporting a difference between the effects on Italian and foreign students in this regard. Consequently, the findings according to which a lower socio-demographic status, such as lower educational aspirations, may have had a stronger positive effect on childlessness among migrant girls, is not supported by empirical evidence for the selected sample of adolescents.

The second component was labelled "*Scared by the Future versus Marriage*". The first dimension loads positively, whereas the intention to get married loads negatively. Thus, higher values on this component are associated with a fearful attitude toward the future and a lower propensity toward marriage. In this case, the signs of the regression coefficients are positive, indicating that an increase in the principal component is associated with an increased probability of belonging to the outcome category relative to the baseline. Interpreting the results for this component, it can be stated that a more fearful attitude toward the future and a lower propensity toward marriage is associated with an increased probability of answering "*No*" and "*Do not Know*" compared to the baseline category "*Yes*".

The observed negative relationship between childlessness and marriage further confirms on the one hand the literature discussed in the first chapter, highlighting a similarity between the patterns observed for the adults and fertility intentions of adolescents. Marriage, in fact, confirms itself as an important factor driving fertility in Italy. On the other hand, this pattern would suggest a still pervasive influence of specific traditional values in Italy. Furthermore, in this case, a fearful attitude toward the future is associated with a lower probability to desire a child, highlighting also the importance of perceived insecurity. The fact that the interaction with the variable *citizenship* is not significant, and so there is no statistical evidence supporting a different effect for Italians and Foreigners. The pattern observed for

adults in this regard, namely that perceived insecurity would exert a greater effect for foreigners, does not hold for this sample.

The third component has been labelled *Marriage in Italy versus Fascinated by Future Abroad.* As happened for the previous components, the first dimension loads positively, whereas the second one loads negatively. In this case, higher values of this component are associated with a higher propensity toward marriage together with a desire to live in Italy in the future, and at the same time a lower propension toward being fascinated by the future and live abroad. For this component, the negative sign of the regression coefficients is associated with a decreased probability of answering both "*No*" and "*Do not Know*", compared to the baseline of the model "*Yes*".

It is important to note that, once again, marriage is associated with a lower probability of being unsure or not wanting to have a child, confirming the negative relationship between childlessness and marriage. However, in this case, being marriage associated with a fearful vision of the future, the positive effect that exerts on fertility is slightly weaker. So, girls who want to get married, even when showing a fearful attitude toward the future, still show greater desire to have children compared to girls who show a more optimistic view of the future. Statistical evidence supporting a difference in the effects for Italians and Foreigners is absent also for this component, confirming that perceived insecurity does not exert a greater effect on foreigners.

The effects of the fourth component, labelled *Marriage Indecision in Italy versus Marriage Abroad*, are particularly interesting. In this case, marriage is still associated with migration intentions, but the combination of these variables is different compared to the one seen earlier. In this case, higher values correspond to greater uncertainty about marriage and a preference to remain in Italy, while lower values are linked to a stronger inclination toward marriage and to live abroad. To begin with, regarding the comparison between "*Yes*" and "*No*", the effect is not significant for the Italian group. In short, there is no statistical evidence that this component influences the choice between be childless in the future or not for Italians. By contrast, since the interaction with citizenship is significant, the effect of this component differs for foreign students. It means that when marriage is associated with specific migration intentions, the effects of these variables on childlessness vary between Italians and Foreigners. In this specific case, the positive coefficient of the interaction, together with and the positive coefficient of the baseline, corresponds to a higher probability for foreign students to answer that they do not want children compared to the baseline category Italians. Similar results come out when it comes to compare "*Yes*" and "*Do not Know*". As regard this second dimension, the

coefficient for the baseline category "Italian" is again positive, but in this case shows a statistical significancy. Hence, the effect of the component on this dimension is stronger for foreign students than for Italians, increasing their odds of responding "*Do not know*" rather than "Yes" as the value of the component rises.

In this case, the impact of specific combinations of marriage and migration intentions on childlessness differs between Italians and foreigners. More specifically, uncertainty about marriage combined with the intention to remain in Italy has a stronger positive effect on childlessness and uncertainty among foreign students, whereas the intention to live abroad combined with a higher propensity toward marriage has a stronger negative effect on childlessness and uncertainty among foreigners.

The last component was labelled *North-East versus North-West* and captures a territorial dimension. Following what was observed for the previous components, the category North-East loads positively, whereas the category North-West loads negatively. Higher values of this component are then associated with a higher propensity toward uncertainty regarding family choices, and at the same time a lower propensity toward clearly defined fertility intentions. For this component, in fact, statistical significance is observed only for the comparison between "*Yes*" and "*Do not Know*". In short, this dimension mainly captures territorial differences in uncertainty rather than clear preferences. In particular, the positive sign of the regression coefficient indicates an increased probability of answering "*Do not Know*" compared to the baseline category *"Yes".*

As regards this component, there is no statistical evidence supporting differences in the effects between Italian and foreign students. The results for this component, beside highlighting a territorial dimension, confirms the findings on education; looking at the loadings charging this component, in fact, an expected enrolment in university, and so the intention to pursue higher education, loads in the same direction as the variable *North-East*. It is important to note that, rather than evidencing differences nationally, this component highlights differences within the north itself, making comparisons with the rest of Italy impossible.

3.2 Socio-Demographic Characteristics of Foreign Adolescents Aged 11-19

Restricting the analysis to migrant girls, it is possible to assess the effect on childlessness of two additional variables. Those are time of arrival in Italy, and the specific citizenship that migrant girls possess. As in the previous regression model, the results have been summarized in two tables. The first reports the comparison between the answers *"Yes"*

and *"No"* while the second presents the comparison between the answer *"Yes"* and *"Do not know"*. In addition, a third table collects the results expressed in terms of odds ratios to facilitate interpretation.

Variable	Coeff. (St. Err.)	P-Value
Time of Arrival	0.196 (0.093)	0.04
Albanian	-1.044 (0.401)	0.009
Chinese	1.311 (0.280)	0.001

Table 9: Restricted multinomial logistic regression. Outcome category: "NO". Baseline category: "YES".

Variable	Coeff. (St. Err.)	P-Value
Time of Arrival	0.048 (0.070)	0.489
Albanian	-0.199 (0.209)	0.341
Chinese	0.595 (0.258)	0.02

Table 10: Restricted multinomial logistic regression. Outcome category: "DO NOT KNOW". Baseline category: "YES".

As the tables show, expected childlessness patterns vary by citizenship and time of arrival in Italy. Specifically, the positive sign of the regression coefficient for the variable time of arrival within *Table 28* indicates that the shorter the time spent in Italy, the higher the probability of answering *"No"* rather than *"Yes"* to the question about future childbearing intentions. This specific outcome seems to contradict the literature on *adaptation*, according to which the longer the time spent in Italy, the higher the probability of remain childless. However, considering that in the previous chapter was showed that migrant students in the selected sample were slightly underrepresented among those who intend to have children, while Italian students were proportionally more likely to express such intentions, the finding that a shorter time spent in Italy is associated with a higher probability of answering *"No"* rather than *"Yes"* supports *adaptation* rather than contradicting it. In fact, in demographic literature, migrants' fertility is often found to be higher than that of natives. Under this interpretation, adaptation implies that the longer migrants reside in Italy, the more their fertility converges

toward the lower fertility levels of natives. But within the sample analysed, the opposite pattern emerges, with migrant adolescents displaying higher levels of expected childlessness compared to natives. In this case, adaptation takes on a different meaning, as confirmed by the results. Over time, migrant adolescents appear to adjust their fertility intentions toward those of Italian adolescents, thereby reducing their initially higher levels of expected childlessness. As *Table 30* shows, instead, regarding the comparison between *"Yes"* and *"Do not Know,"* no variables were found to be statistically significant, indicating that none of the included components or covariates reliably affect the odds of being unsure about future childbearing intentions compared to wanting children.

Finally, when it comes to assess the effect of girls' specific citizenship, differences in reproductive intentions across the main countries of origin remain quite substantial, pointing toward a probable conservation of cultural norms particularly for a specific ethnic group. In particular, *Table 30* indicates that Chinese students are more likely to respond *"No"* rather than *"Yes"* regarding future childbearing intentions, relative to students from other citizenships. This finding was not entirely expected based on the adult-focused literature, which suggested that migrants from North-Africa displayed childlessness expectations more distinct from those of native students. Chinese students show a significant impact also for the comparison between *"Yes"* and *"Do not Know"*, being also the only variable showing statistical significancy in this regard. In fact, Chinese students have also higher odds of responding *"Do not Know"* rather than *"Yes"* about their future childbearing intentions, compared to students from other citizenships. Contrary to Chinese students, Albanian girls were found to be more incline toward childbearing compared to migrant girls with other citizenships, thus potentially aligning with the literature that found similarities between the reproductive behaviour of Albanian women and natives.

Conclusions

The main aim of this dissertation was that of detect which socio-demographic determinants are associated with expectations regarding family formation among Italian and Immigrant students in Italy, trying to add insights to the literature for adult women on the same topic and evidencing potential differences between the two groups. The analysis was carried out following robust statistical methods; running a PCA on the many selected variables allowed for a reduced collinearity and an easier interpretation of the results, whereas using multiple multinomial regression models made it possible to estimate the effects of the principal components and the other variables on the outcome category of intended childbearing. To begin with, the fact that over the 80% of the students reported to desire a child in the future suggest that family formation is a diffuse choice among both Italian and migrant adolescents, despite foreign adolescents display a slightly weaker desire for childbearing. Furthermore, results highlight that the variables influencing adolescent childbearing intentions are similar to the ones affecting adult women, although some effects differ. Moreover, whereas on one hand some variables influence family formation differently between migrants and natives, on the other hand foreigners' preferences are also shaped by few additional variables more closely related with their migration background.

Firstly, a positive association between high educational attainment and childlessness holds. This pattern is particularly challenging to interpret; on one hand it may suggest that adolescent girls yet perceive a higher educational attainment as less compatible with family formation. If this is the case, these attitudes have been reasonably influenced by poor family policies and scarce state-support to childbearing in Italy, that did not help more educated women to conciliate higher educational aspirations and family formation. Hence, this dynamic may have contributed to maintain traditional representations of motherhood that potentially influence the preferences of young people. On the other hand, it may simply be the case that highly educated adolescents more likely share post-materialistic values, thereby prioritizing their education trajectories over childbearing. Looking instead at the comparison between Italians and Migrants, there is no ground to affirm a different effect for the two groups. By consequence, the reported findings in the literature review that a lower socio-demographic status, such as a lower educational level, had a stronger positive effect on childlessness among migrants, are more probably associated with the economic insecurity that has a more visible effect in adulthood.

Secondly, results highlight a strong link between marriage and the will to have a child in the future, confirming literature on adult women and the fact that marriage still play a crucial role in shaping family formation plans in Italy, suggesting a preference for traditional childbearing schemes. At the same time, as showed by the principal components, marriage seems to exert a different effect on Italians and Foreigners depending on the variables which with it correlates. In this specific case, the effect of this dimension differs between the groups when it correlates with specific expected future migration patterns; when uncertainty about marriage is combined with the intention to remain in Italy in the future, it shows a positive effect on childlessness and uncertainty only among foreign students, whereas a positive attitude toward marriage moving in the same direction as the intention to live abroad has a stronger negative effect on childlessness and uncertainty for migrant girls. These findings indicate that, while marriage continues to play an important role in childbearing in Italy overall, the association is stronger among migrant girls under specific conditions, exhibiting cultural differences between natives and students with a migratory background, giving effort in this case to the theories of *socialization* and *particularized ideology*.

Across two principal components, marriage is linked with different attitudes toward the future. When marriage correlates with an optimistic view of the future, a strong negative effect on childlessness is reliable. When marriage is instead linked with a fearful vision of the future, it exerts on childlessness a weaker but still negative effect, confirming also the importance of future perceptions on childbearing intentions. In addition, a non-optimistic attitude toward the future does not exert a differential effect between Italians and foreigners, further failing to support a greater effect of insecurity on childbearing patterns of foreigners.

Thirdly, living in North-Eastern Italy is positively associated with childlessness, and living in North-Western Italy shows instead negative association. These results give credit to the findings as regard education, because, looking at the loadings charging the component, an expected enrolment in university loads in the same direction as the variable *North-East.* Considered that this component highlights differences within the north itself, any comment on a broader comparison with the rest of Italy would be groundless.

Finally, focusing solely on migrant girls, it has been possible to assess the effect of an additional set of variables reliable only for migrant girls, further confirming that variables influencing expected childlessness could vary between natives and migrants. Specifically, childlessness expectations of foreigners vary significantly by time of arrival in Italy and country of citizenship. In fact, results show that the shorter the time spent in Italy for migrant girls, the higher the probability of answering *"No"* rather than *"Yes"* to the question about

future childbearing intentions. Thus, the variable time of arrival and expected childlessness are positively correlated. As discussed within the results section, this finding aligns with *adaptation* hypothesis rather than opposing to it, because for the selected sample foreigners have higher childlessness expectations compared to Italians. Finally, Chinese students show higher propensity to respond *"No"* rather than *"Yes"* regarding childbearing intentions, relative to students from other citizenships. For Chinese students, a positive relationship holds also for indecision on childbearing. These findings were not entirely expected; whereas effects confirming *socialization* and *particularized ideology hypothesis* were found to hold for other citizenships, results for Chinese students so introduce a novel contribution. By contrast, results for Albanian girls possibly align more with the discussed literature, because, compared to the other migrant adolescents, are in fact more incline toward childbearing, exhibiting intentions that might resembling those of natives.

Bibliography

Alderotti, G., Mussino, E., & Comolli, C. (2019). *Natives and migrants' childbearing during the great recession: A comparison between Italy and Sweden.* Stockholm Research Reports in Demography No 17. Available at: https://doi.org/10.17045/sthlmuni.8175446

Aassve, A., Conzo, P., Luppi, F., & Mencarini, L. (2024). *Generalised morality and contemporary fertility dynamics across European regions.* Regional Studies. Available at: https://doi.org/10.1080/00343404.2024.2361126

Beaujouan, E., Brzozowska, Z., & Zeman, K. (2015). *Childlessness trends in twentieth-century Europe: Limited link to growing educational attainment*. VID Working Paper No. 6/2015. Vienna Institute of Demography, Austrian Academy of Sciences. Available at: http://www.econstor.eu/bitstream/10419/126219/1/833265830.pdf

Berry, J. W. (1997). *Immigration, acculturation, and adaptation.* Applied Psychology: An International Review, 46(1), 5–68. Available at: https://doi.org/10.1111/j.1464-0597.1997.tb01087.x

Berry, J. W. (2001). *A psychology of immigration*. Journal of Social Issues, 57(3), 615– 631. Available at: https://doi.org/10.1111/0022-4537.00231

Becker, G. S. (1960). *An economic analysis of fertility*. NBER Working Paper No. 11. National Bureau of Economic Research. Available at: https://www.nber.org/papers/w0011

Boyd, R. L. (1989). *Racial differences in childlessness: A centennial review.* Sociological Perspectives, 32(2), 183–199. Available at: https://www.jstor.org/stable/1389096

Cantalini, S., & Mussino, E. (2022). *Influences of origin and destination on migrant fertility in Europe.* Population, Space and Place, 28(7), e2567. Available at: https://doi.org/10.1002/psp.2567

Carella, M., Del Rey Poveda, A., & Zanasi, F. (2021). Post-migration fertility in Southern Europe: Romanian and Moroccan women in Italy and Spain. Migration Letters, 18(6), 745–760. Available at: https://doi.org/10.33182/ml.v18i6.1617

Coleman, D. A. (1994). *Trends in fertility and intermarriage among immigrant populations in Western Europe as measures of integration*. Journal of Biosocial Science, 26(1), 107–136. Available at: https://doi.org/10.1017/S0021932000021106

Coleman, D. (2004). *Why we don't have to believe without doubting in the "Second Demographic Transition"—Some agnostic comments.* Vienna Yearbook of Population Research, 2, 11–24. Available at: https://www.jstor.org/stable/23025433

Coleman, D. (2006). *Immigration and ethnic change in low-fertility countries: A third demographic transition.* Population and Development Review, 32(3), 401–446. Available at: https://doi.org/10.1111/j.1728-4457.2006.00131.x

Dal Ben, A. (2017). *The Italian "No Mommy" women: Motivations for childlessness in the North-East of Italy*. Interdisciplinary Journal of Family Studies, 22(1), 35–52. Available at: https://hdl.handle.net/11577/3294970

Dalla Zuanna, G., & Impicciatore, R. (2016). *The impact of education on fertility in Italy: Changes across cohorts and south–north differences. International Journal of Methodology*. Available at: https://doi.org/10.1007/s11135-016-0388-0

Donno, A., & Tanturri, M. L. (2020). *Childlessness and education: The case of Italy and Finland* (Working Paper Series DSS). Università degli Studi di Padova. Available at: https://hdl.handle.net/11577/3442420

García-Pereiro, T., & Paterno, A. (2024). *Comparison of short-term fertility intentions of Albanian women in Italy with non-migrants in Albania and Italian women.* Statistical Methods & Applications, 33, 999–1024. Available at: https://doi.org/10.1007/s10260-023-00715-z

GeeksforGeeks. (2025). *Principal Component Analysis (PCA).* From: https://www.geeksforgeeks.org/data-analysis/principal-component-analysis-pca/

Goldscheider, C., & Uhlenberg, P. R. (1969). *Minority group status and fertility.* American Journal of Sociology, 74(4), 361–372. Available at: https://www.jstor.org/stable/2776057

González, M.-J., & Jurado-Guerrero, T. (2006). *Remaining childless in affluent economies: A comparison of France, West Germany, Italy and Spain, 1994–2001.* Comparative Population Studies, 31(4), 495–520.
Available at:
https://doi.org/10.1007/s10680-006-9000-y?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle

Graham, E., Sabater, A., & Fiori, F. (2016). Fertility change in the context of economic recession in Italy and Spain. ESRC Centre for Population Change, Briefing No 36.
Available at:
https://eprints.soton.ac.uk/399527/1/Briefing_36_Fertility_Change_in_the_Context_of_Economic_Recession.pdf

Hammel, E. A. (1990). *A theory of culture for demography.* Population and Development Review, 16(3), 455–485. Available at: https://www.jstor.org/stable/1972832

Impicciatore, R., Gabrielli, G., & Paterno, A. (2020). Migrants' fertility in Italy: A comparison between origin and destination. European Journal of Population, 36, 799–825. Available at: https://doi.org/10.1007/s10680-019-09553-w

Istituto Nazionale di Statistica (2024a). *Indagine bambini e ragazzi – Anno 2023*.
Available at: https://www.istat.it/it/files/2024/05/Bambini-e-ragazzi-2023.pdf

Istituto Nazionale di Statistica (2024b). *Natalità e fecondità della popolazione residente – Anno 2023.* Available at: https://www.istat.it/wp-content/uploads/2024/10/Natalita-in-Italia-Anno-2023.pdf

Kasarda, J. D. (1979). *How female education reduces fertility: Models and needed research.* Mid-American Review of Sociology, 4(1), 1–22.
Available at: https://www.jstor.org/stable/23252607

Kulu, H., Milewski, N., Hannemann, T., & Mikolai, J. (2019). *A decade of life-course research on fertility of immigrants and their descendants in Europe.* Demographic Research, 40, 1345–1374. Available at: https://doi.org/10.4054/DemRes.2019.40.46

Lesthaeghe, R. (1991). *The second demographic transition in Western countries: An interpretation.* IPO Working Paper No. 1991-2. Institut voor Sociale en Economische Geografie, Katholieke Universiteit Leuven.
Available at: https://brispo.research.vub.be/sites/default/files/2024-02/WP-IPD-1991-2.pdf

Lesthaeghe, R., & Surkyn, J. (2007). *When history moves on: The foundations and diffusion of a second demographic transition*. Conference draft. Interface Demography, Vrije Universiteit, Brussels.
Available at:
https://www.researchgate.net/publication/228350491_When_History_Moves_On_The_Foundations_and_Diffusion_of_a_Second_Demographic_Transition

Lesthaeghe, R (2014). *The Second Demographic Transition: A Coincise Overview of its Development*. Proceedings of the National Academy of Sciences, 111(51), 18112-18115. Available at: https://doi.org/10.1073/pnas.1420441111

Lesthaeghe, R. (2020). *The second demographic transition, 1986–2020: Sub-replacement fertility and rising cohabitation—a global update.* Genus, 76, Article 10.
Available at: https://doi.org/10.1186/s41118-020-00077-4

Martin, T. F. (2020). *Toward a theory of fertility and ethnic social capital.* Marriage & Family Review, 56(1), 1–19. Available at: https://doi.org/10.1080/01494929.2019.1630046

Mathieu, S. (2013) *Entre l'effet tempo et l'effet quantum: une analyse de l'effet des politiques familiales sur la fécondité dans les pays avancés*. Sociologie et sociètès, 45(1), 255-276. Available at: https://doi.org/10.7202/1016403ar

McDonald, P. (2000). *Gender equity in theories of fertility transition.* Population and Development Review, 26(3), 427–439.
Available at: https://doi.org/10.1111/j.1728-4457.2000.00427.x

McDonald, P. (2006). *Low Fertility and the State: The Efficacy of Policy.* Population and Development Review, 32(3), 485-510. Available at: https://www.jstor.org/stable/20058901

Mencarini, L., & Tanturri, M. L. (2006). *High fertility or childlessness: Micro-level determinants of reproductive behaviour in Italy*. Population, 61(4), 389–415. Available at: https://doi.org/10.3917/popu.604.0463

Mencarini, L., & Tanturri, M. L. (2008). *Childless or childfree? Paths to voluntary childlessness in Italy.* Population and Development Review, 34(1), 51–77. Available at: https://doi.org/10.1111/j.1728-4457.2008.00205.x

Miaci, E. (2025). *Migrants and motherhood: Unveiling the fertility trends of migrant women in Italy*. Doctoral dissertation. School of Statistical Sciences. XXXVI cycle. Available at: https://iris.uniroma1.it/retrieve/449aa8b9-6aa1-4a38-9307-32a866a99295/Tesi_dottorato_Miaci.pdf

Milewski, N. (2007). *First child of immigrant workers and their descendants in West Germany: Interrelation of events, disruption, or adaptation?* Demographic Research, 17, 859–896. Available at: https://doi.org/10.4054/DemRes.2007.17.29

Mussino, E., & Van Raalte, A. (2008). *Fertility of migrants: A comparative study between Italy and Russia*. MPIDR Working Paper No. WP 2008-026. Max Planck Institute for Demographic Research. Available at: https://www.demogr.mpg.de/papers/working/wp-2008-026.pdf

Mussino, E., & Strozza, S. (2012). *The fertility of immigrants after arrival: The Italian case.* Demographic Research, 26, 99–130. Available at: 10.4054/DemRes.2012.26.4

Mussino, E., Gabrielli, G., Paterno, A., Strozza, S., & Terzera, L. (2015). *Motherhood of foreign women in Lombardy: Testing the effects of migration by citizenship.* Demographic Research, 33, 653–664. Available at: https://doi.org/10.4054/DemRes.2015.33.23

Mussino, E., Gabrielli, G., & Ortensi, L. E. (2021). *Fertility intentions within a 3-year time frame: A comparison between migrant and native Italian women.* Journal of International Migration and Integration, 24(Suppl 1), S233–S260.
Available at: https://doi.org/10.4054/DemRes.2012.26.4

Ritchey, P. N. (1975). *The effect of minority group status on fertility: A re-examination of concepts.* Population Studies, 29(2), 249–257.
Available at: https://www.jstor.org/stable/2173510

Rosina, A., & Testa, M. R. (2009). *Couples' first child intentions and disagreement: An analysis of the Italian case.* Genus, 65(2), 91–113. Available at: https://doi.org/10.1186/2037-6638-65-2-91

ScienceDirect. (n.d.a). Logistic regression model. In ScienceDirect Topics.
From:
https://www.sciencedirect.com/topics/computer-science/logistic-regression-model

ScienceDirect. (n.d.b). *Akaike Information Criterion*. In ScienceDirect Topics.
From:
https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/akaike-information-criterion

Sly, D. F. (1970). *Minority-group status and fertility: An extension of Goldscheider and Uhlenberg.* American Journal of Sociology, 76(3), 443–459.
Available at: https://www.jstor.org/stable/2775732

Sorenson, A. M. (1985). *Fertility expectations and ethnic identity among Mexican-American adolescents: An expression of cultural ideals*. Sociological Perspectives, 28(3), 339–360.
Available at: https://www.jstor.org/stable/1389151

Tanturri, M. L., Mills, M., Rotkirch, A., Sobotka, T., Takács, J., Miettinen, A., Faludi, C., Kantsa, V., & Nasiri, D. (2015). *State-of-the-art report: Childlessness in Europe. Families And Societies*. Working Paper Series, No. 32. Stockholm University.
Available at:

http://www.familiesandsocieties.eu/wp-content/uploads/2015/03/WP32TanturriEtAl2015.pdf

Tanturri, M. L. (2013). *Determinants of childlessness among men and women in Italy: Does socio-economic status act in a different way?* Paper presented at the XXVII IUSSP International Population Conference, Busan, South Korea.
Available at: https://paa2013.populationassociation.org/papers/131642

Testa, M. R. (2012). *Women's Fertility Intentions and Level of Education: Why are They Positively Correlated in Europe?* European Demographic Research Papers. Vienna Institute of Demography.
Available at: https://www.oeaw.ac.at/fileadmin/subsites/Institute/VID/PDF/Publications/EDRP/edrp_2012_03.pdf

Tocchioni, V. (2018). *Exploring the childless universe: Profiles of women and men without children in Italy*. Demographic Research, 38, 451–470.
Available at: https://www.jstor.org/stable/26457053

Van de Kaa, D. J. (2001). *Postmodern fertility preferences: From changing value orientation to new behavior*. Population and Development Review, 27 (Supplement: Global Fertility Transition), 290–331. Available at: https://www.jstor.org/stable/3115262

Van de Kaa, D. J. (2002). *The idea of a Second Demographic Transition in industrialized countries.* Paper presented at the Sixth Welfare Policy Seminar, National Institute of Population and Social Security, Tokyo, Japan.
Available at: https://www.researchgate.net/publication/253714045_The_Idea_of_a_Second_Demographic_Transition_in_Industrialized_Countries

Vasireddy, S., Berrington, A., Kuang, B., & Kulu, H. (2023). *Education and fertility: A review of recent research in Europe.* Comparative Population Studies, 48, 553–588.
Available at: https://doi.org/10.12765/CPoS-2023-18