Family dynamics of international migrants and their descendants

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Abstract

This dissertation explores the relationship between two demographic phenomena—migration and fertility—by focussing on several aspects of the link between the two across the different empirical chapters. The thesis consists of three independent research papers that are all tied together by the same theoretical framework that has been proposed in the literature to explain the link between migration and fertility (selection, disruption, interrelation of events, socialization and adaptation). Chapter 2 and 3 analyse the fertility behaviour of Senegalese migrants in Europe. While Chapter 2 takes a descriptive approach to family trajectories of male and female migrants and how they evolve in the time prior and following migration, Chapter 3 compares the fertility behaviour of migrant and non-migrant couples. Finally, Chapter 4 focuses on adolescent Latin American child migrants in Spain and their fertility preferences compared to native Spanish youth. The findings of the dissertation contribute to our understanding of the interplay between migration and fertility, and provide theoretical and methodological implications for the study of migrant fertility.

Resum

Aquesta tesi investiga la relació entre dos fenòmens demogràfics—migració i fecunditat—fent èmfasi en distints aspectes de la relació entre els dos, a través dels diferents capítols empírics. La tesi consisteix en tres articles de recerca relacionats entre ells pel mateix marc teòric, que expliquen la relació entre migració i fecunditat (selecció, disrupció, interrelació dels esdeveniments, socialització i adaptació). Els Capítols 2 i 3 analitzen el comportament del migrants Senegalesos a Europa referent a la fecunditat. Mentre que el Capítol 2 descriu les trajectòries familiars dels homes i dones migrants i com evolucionen abans i després de migrar, el Capítol 3 compara la fecunditat de les parelles migrants i les parelles no-migrants a origen. Finalment, el Capítol 4 es centra en nens migrants adolescents provinents d'Amèrica Llatina a Espanya i les seves preferències de fecunditat en comparació amb els joves de la mateixa edat nascuts a Espanya. Els resultats de la tesi contribueixen a una millor comprensió de la interacció entre migració i fecunditat, a més de proporcionar implicacions teòriques i metodològiques per estudiar la fecunditat dels migrants.

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CHAPTER 1:

General introduction

Migration flows towards Europe have been increasing during the last decades, and the number of migrants and their descendants—born abroad or at destination—is steadily growing. As migrants play an increasingly important role in the demographic, social and cultural landscape of European societies, there is a growing interest in their family dynamics. In this context, demographic research has paid increasing attention to how the migration move affects migrants' fertility behaviour, fertility differentials between migrants and the native-born population at destination, and whether or not these converge over time and across migrant generations; and finally, how migrant fertility contributes to birth rates and population growth in destination countries.

This dissertation is an attempt to analyse family dynamics—union formation and childbearing—of migrants and their descendants from different origin countries to Europe. By building on the major mechanisms that have been advanced in the demographic literature to describe and explain migrant fertility behaviour and by addressing several gaps in current research, this dissertation has two major aims that can be summarized as follows:

1) *Examining fertility behaviour from a life course and a couples perspective by focusing explicitly on both men and women's migration experience and the whereabouts of both partners.*

2) *Analysing fertility convergence (or the lack thereof) among the descendants of immigrants and the native population.*

Both aims are pursued by taking a special focus on migrant selection processes that may be at work not only for first generation migrants, but also for subsequent migrant generations through parental selective migration. Furthermore, in order to comprehensively address these two objectives, the dissertation looks at both fertility timing as well as fertility quantum.

When I started to work on this dissertation project, I had a lot of questions in mind and for some it was difficult to find satisfying answers in the existing scholarly literature. Several studies focus on the timing of migrants' childbearing by analysing transitions to a first or subsequent birth (Lübke 2014; Milewski 2007, 2011). Others examine fertility differentials between migrants and natives in terms of their completed or cohort fertility (Alders 2000; Mayer and Riphahn 2000; Schmid and Kohls 2009). But a question that remained unanswered was how family life actually looked in the years before and after the migration move. 'Family life' as a dynamic process with a holistic perspective, going beyond birth transitions and completed fertility in the destination society, by examining union formation and childbearing over the life course. This led me to the idea for the first empirical article (Chapter 2): analysing individual family trajectories of migrants before and after migration. This seemed an interesting approach, since migration, union formation and fertility have been found to be interrelated events for other migratory flows (Andersson 2004; Milewski 2007; Wolf 2016), and the fertility of marriage migrants has attracted some attention (Lievens 1999; Wolf 2016), but extensive analyses of this phenomenon are rare. Furthermore, previous studies on marriage migrants have focused only on certain immigrant groups, mainly Turks in Germany, or Turks and Moroccans in The Netherlands or Belgium. Therefore, in a context where marriage migration and as well as union formation at a distance have been found to occur frequently, as in Senegal (Baizán et al. 2014), a more in-depth examination seemed appropriate. Thus, the first empirical article served as a rather descriptive introduction to the topic of family formation in the context of international migration, and, more specifically, of Senegalese family structures. From a more pragmatic point of view—and as every

thesis is a process of learning—it helped me to understand the complexities of longitudinal data structures.

Although the first article is mostly descriptive, its findings provided a basis for the subsequent empirical article (Chapter 3). The clear interrelatedness of migration and family formation trajectories, especially for women, and the differences between male and female patterns led me to the idea of using the couple as the unit of analysis. This makes sense if childbearing occurs mainly within partnerships, like in the Senegalese case. Previous studies often analyse female migrants' behaviour only, disregarding the location of the father of the children before and after childbirth (Milewski 2007, 2010, 2011). Only some studies include migrant men's migration trajectories and their relation to fertility (Guetto and Panichella 2013; Wolf 2016), though they do not adopt a couples perspective. However, as argued by Lindstrom and Giorguli-Saucedo, male and female migration and fertility trajectories tend to be "coordinated and interdependent" and part of a joint household strategy (Lindstrom and Giorguli-Saucedo 2007, p. 827). Hence, in the second study I opted for a couples perspective in order to take into consideration the whereabouts of both the male and the female partner to better understand fertility behaviour of migrant couples and non-migrant couples at origin. The aim of the second article was to analyse fertility timing and quantum of migrant and non-migrant partners. By introducing non-migrant couples as a reference category, I am able to disentangle the migrant selection process and its role in explaining differential fertility behaviour, a rather understudied topic, as bi-national samples from origin and destination areas needed for this kind of analysis are rare. For the Mexico-US migratory system, several studies examine migrant selection processes and fertility outcomes (Choi 2014; Frank and Heuveline 2005; Lindstrom and Giorguli-Saucedo 2002; Parrado 2011) arriving at different conclusions. So, what could be expected for Senegalese migration to Europe?

The results of the second article show clearly that selectivity plays a crucial role in explaining the fertility behaviour of international migrants of the first generation. But what was not clear was the applicability of these findings to subsequent generations. Is parental positive or negative

selection also transferred to migrants of the 1.5 or second generation?[1] Starting from this question, the focus of the last empirical chapter (Chapter 4) lays on the descendants of immigrants. Apart from the interest in migrant selection processes for subsequent migrant generations, the idea for the third article was to compare adolescents of migrant origin with native youths in terms of their preferences for future fertility outcomes to unravel socialization and adaptation processes. Could the socialization and adaptation hypotheses, originally developed to study the fertility behaviour of first-generation migrants, also be extended to the analysis of fertility preferences of the descendants of immigrants? Previous literature on fertility of the descendants of immigrants—1.5 or second generation—is scarce, and the existing studies in Europe focus mainly on Turkish or Moroccan origins (Alders 2000; Krapf and Wolf 2015; Milewski 2011). Only very recently, several articles have been published analysing the childbearing patterns of descendants of immigrants in several European countries, in an attempt to fill this gap in current research (Andersson et al. 2017; Kulu and Hannemann 2016; Pailhé 2017; Puur et al. 2017; Van Landschoot et al. 2017). But what has been found for these migrant origins might be different or less pronounced among other groups and in other migratory contexts and, furthermore, it is not clear whether fertility preferences follow the same patterns as actual behaviour. Therefore, it seemed interesting to broaden the empirical scope by focusing on other migratory flows and on youth's fertility preferences.

This introductory chapter is structured as follows. First, a brief summary of the theoretical framework and the relevant literature is presented, highlighting the gaps in current demographic research. Second, I introduce the two different datasets utilized and present the cases of study, stressing their empirical relevance. Finally, a short summary of the three empirical chapters is provided.

[1] '1.5 generation'—also 'child migrants' or 'middle generation'—refers to individuals who were born abroad and who migrated (with one/both foreign-born parents or following them) during childhood or adolescence (usually before age 16 or 18). Migrants of the 'second generation' are born at destination to one or two (depending on the definition used) foreign-born parents.

1.1 Literature review and research gaps

The life course approach assumes that an individual's life path is composed of the sequencing of different events or transitions, which are rooted in distinct careers or trajectories (Kulu and Milewski 2007). This approach as a methodological framework for the study of the behaviour of individuals from a longitudinal perspective was introduced to demographic research in the 1970s and has since been applied widely. However, as of now, there is no comprehensive life course theory (Huinink and Kohli 2014).

The advantage of applying a life course perspective is due to the fact that the relationship between two or more parallel careers/domains/dimensions/trajectories can be disentangled (Huinink and Kohli 2014; Mulder and Wagner 1993) and the interdependences between them can be examined. The study of fertility has also changed from the non-individualistic analysis of cohorts using aggregated data towards a longitudinal individual-level life course approach. This perspective integrates fertility 'horizontally' into the life course of an individual and allows accounting for its interdependences with other parallel life domains, such as the work career. Besides these 'synchronical' interdependences, different domains can also be interrelated 'diachronically', meaning that past experiences can affect current fertility decisions and outcomes ("interdependence between past, present and future"; Huinink and Kohli 2014).

The life course perspective has also increasingly found its way into migration research, e.g. to study immigrants' occupational careers and social mobility after migration (Constant and Massey 2005; Obucina 2013); or the interrelation between marriage (Mulder and Wagner 1993) or union dissolution (Boyle et al. 2008) and internal or international migration. In most recent studies on migrant fertility, the life course approach is gaining importance, as international migration and family formation are two trajectories that have been found to be strongly interdependent. Most recent analyses are performed using longitudinal individual-level data of migrants and their descendants (Andersson et al. 2017; Kulu and Hannemann 2016; Milewski 2007, 2011; Pailhé 2017; Puur et al. 2017; Van Landschoot et al. 2017; Wolf 2016).

The relationship between migration and fertility trajectories can be bidirectional, since fertility may influence migration decisions, and spatial mobility also may affect fertility behaviour (Kulu 2005; Lindstrom and Giorguli-Saucedo 2007). The relationship between migration and childbearing is often mediated through union formation as another career, which may influence both migration and fertility decisions and outcomes. For marriage migrants, for instance, the move abroad, marriage and fertility are strongly interrelated trajectories (Lievens 1999). Most studies on migrant fertility assume that the causal direction runs from migration to fertility—i.e. the migration move affects birth probabilities—or they act on the assumption that both events are interrelated. Only few scholars assumed a reversed direction of causality running from fertility to migration (Ribe and Schultz 1980) or performed simultaneous-equations models in order to analyse both directions of causality jointly (Kulu 2005; Kulu and Steele 2013).

Several mechanisms or hypotheses have been proposed that attempt to explain the influence of internal and international migration on fertility trajectories, as well as the interrelatedness between both careers. These mechanisms have been applied mainly to study how individuals coming from origin countries (with relatively high levels of fertility and early fertility calendars) behave once they have migrated to countries with low and late fertility patterns. The hypotheses can be divided broadly into those explaining the direct effect that migration has on fertility trajectories in terms of timing and their interrelatedness in the short run (disruption, interrelation of events), and those comparing fertility differentials and similarities between migrants and the native population at destination in the mid and long run (adaptation, socialization). The selection hypothesis, in contrast, postulates that immigrants have different fertility outcomes compared to the non-migrants at origin, because they are a selected group from their origin population with differential fertility behaviour. Using the life course approach, disruption and interrelation of events can be interpreted with synchronical interdependences between the two events, while the other three can be understood diachronically, since fertility preferences and behaviour may be adapted (or not) to current circumstances of the life course in the receiving country, as well as the selectivity of migrants may condition current fertility outcomes (Huinink and Kohli 2014). The purpose of the next sections is to summarize the

theoretical mechanisms linking migration and fertility by discussing the relevant literature and highlighting existing gaps.

1.1.1 Disruption and interrelation of events

The *disruption* hypothesis affirms that migrants have low levels of fertility in the time preceding and following migration due to economic and psychological stress or due to the geographical separation of couples (Carlson 1985; Kulu 2005; Kulu and González-Ferrer 2014; Milewski 2007; Stephen and Bean 1992). Childbearing may also be postponed in anticipation of an upcoming migration move (Andersson 2004; Lübke 2014; Milewski 2007). Moreover, migration may have a disruptive effect on union formation (Brockerhoff 1995; Carlson 1985; Milewski 2003; Ng and Nault 1997), implying low levels of marriage after migration and increased marital age. Instead of lower fertility levels shortly after migration, research found increased birth risks in the immediate time after the move. This was interpreted as a "catching-up behaviour" to make up for births that had been postponed before the migration move (Adserà and Ferrer 2014; Goldstein and Goldstein 1981; Milewski 2007). These higher levels of fertility in the time after migration have also been interpreted as an *interrelation of the migration, union formation and childbearing trajectories*, coinciding at the same time or one shortly after the other (Andersson 2004; Lindstrom and Giorguli-Saucedo 2002, 2007; Lübke 2014; Milewski 2007; Mulder and Wagner 1993; Singley and Landale 1998; Stark 1988). This is particularly the case for marriage migrants, for whom union formation is directly linked to the migration move and both events occur simultaneously (Andersson 2004; Milewski 2007; Wolf 2016). Couples who participate in marriage migration tend to have a very fast transition to a first birth once both partners are together at destination (Andersson 2004; Lievens 1999; Lindstrom and Giorguli-Saucedo 2002; Nedoluzhko and Agadjanian 2010; Nedoluzhko and Andersson 2007; Wolf 2016). However, marriage migration does not affect the timing of second- and higher-order births (Lindstrom and Giorguli-Saucedo 2007). The fast transitions to a first birth have been interpreted as an act to complete the union formation of a couple and to strengthen the position of the newly arrived woman (Milewski 2007).[2] Having a fast transition to a

[2] In most cases marriage migrants are women—"imported brides" (Adserà and Ferrer 2014).

(first) child shortly after arrival has also been interpreted as a legal strategy to get the citizenship of the destination country (e.g. US) for that child and the parents themselves (Lindstrom and Giorguli-Saucedo 2007). In several European countries, other advantages may emerge—such as social security and health care benefits—as well as the children's right to education (Bledsoe et al. 2007; Bledsoe and Sow 2008).

As both hypotheses—disruption and interrelation of events—explain the direct interaction between the migration move and fertility, they apply to migrants of the first generation, who migrate in their fertile years. Furthermore, both mechanisms imply an increase or decrease in fertility levels that should be temporary, but in most migratory settings completed fertility is not affected (Kulu and González-Ferrer 2014). However, if couples cannot make up for the disrupted fertility—e.g. due to prolonged geographical separations—fertility quantum may also be affected. It can be expected that, especially in long-distance intercontinental migration flows, with low possibilities of circular migration strategies, long-lasting separations of partners may have an impact not only on birth probabilities in the short run, but fertility levels are likely to be lower permanently.

An important gap in the literature examining the disruption and interrelation of events hypotheses of migrants is related to the fact that previous research rarely has taken a holistic perspective on migration and family formation trajectories (Kulu and González-Ferrer 2014). Most studies take an event-centred approach by analysing birth transitions mainly after migration. However, to gain insights into how different trajectories evolve before and after migration, several transitions throughout the life course should be analysed jointly, e.g. union formation, childbearing and migration.

Finally, many studies on migrant fertility analyse only female behaviour and ignore the location of the father of the children. However, as argued by Lindstrom and Giorguli-Saucedo, male and female migration and fertility trajectories tend to be "coordinated and interdependent" and part of a joint household strategy (Lindstrom and Giorguli-Saucedo 2007, p. 827). Childbearing, migration trajectories, and fertility disruption can only be studied correctly if the whereabouts of both partners are taken into consideration.

1.1.2 Adaptation and socialization

The adaptation and socialization hypotheses focus on medium and long-term fertility behaviour of migrants vis-à-vis the fertility of the native population at destination. Both hypotheses are based on the assumption that fertility timing and quantum are different in origin and destination countries. On the one hand, the *adaptation* mechanism argues that migrants' fertility behaviour converges towards the patterns prevalent at destination with duration of stay (Andersson 2004). Hence, migrants' fertility gradually diverges from the patterns prevalent in their origin countries. This convergence does not necessarily imply a "process of acculturation, but can merely be seen as an adaptation to the general situation in the new country" (Andersson 2004, p. 752), with different political and societal systems, a different labour-market, different gender roles (Andersson 2004), as well as higher costs of having children (Lindstrom and Giorguli-Saucedo 2007). The adaptation towards the new environment at destination may begin shortly after the migration move (Lindstrom and Giorguli-Saucedo 2002). Finally, it has been found that women's duration at destination is more important than that of men for fertility adaptation (Lindstrom and Giorguli-Saucedo 2002).

On the other hand, the *socialization* hypothesis postulates that migrants of the first generation will maintain the childbearing patterns of their origin country, and only the second and subsequent generations will have fertility patterns that are more similar to those of the native population at destination (Milewski 2007). This mechanism builds on the assumption that the socialization environment during childhood and adolescence, with its culture, values and norms, will shape the fertility behaviour during the whole life course, including after migration (Hervitz 1985; Milewski 2007). In short, while the adaptation hypothesis foresees changes in the fertility behaviour of the migrants themselves, the socialization hypothesis is mainly used to explain situations where no changes after migration are observed, or to describe the childbearing patterns of the descendants of immigrants that were born and socialized at destination. However, current literature pays little attention to the fertility of the 1.5-generation, an interesting case to study, since they were socialized partly at origin and partly at destination, and over time they may adapt to the fertility patterns of the native population.

The theoretical foundation of fertility adaptation can be seen in the assimilation theory developed in the US (Gordon 1964). The classical assimilation theory assumes that ethnic or racial, as well as cultural and social differences, decline or even disappear over time (Alba and Nee 1997). Immigrants and their descendants will become assimilated into the receiving society's majority population following a gradual, inevitable and irreversible process (Alba and Nee 1997; Zhou 1997). The fertility behaviour of immigrants, as one part of the general process of immigrant assimilation (Parrado and Morgan 2008), should also follow this model of gradual adaptation across time and generations towards the fertility norms and practices prevalent at destination, as immigrants achieve cultural and socioeconomic integration (Alba and Nee 1997; Choi 2014).

The classical assimilation theory has often been criticized, since neither origin nor receiving societies can be seen as homogenous groups and immigrants may adapt to specific groups or elements of the host society, and not to the mainstream society in general, resulting in "segmented assimilation" (Parrado and Morgan 2008; Portes and Zhou 1993). Particularly for the second generation, "[a]long with individual and family variables, the context that immigrants find upon arrival in their new country plays a decisive role in the course that their offspring's lives will follow" (Portes and Zhou 1993, p. 82). Fertility assimilation (or the lack of it) of immigrants in the US has also been explained using the segmented assimilation theory. For instance, Mexican immigrants may be relegated to downward social mobility as they enter the US with low levels of human capital and facing a negative reception context (Portes and Zhou 1993), resulting in increasing fertility levels across migrant generations, i.e. immigrant women of the third generation having an even higher completed fertility compared to those of the second generation (Choi 2014; Parrado and Morgan 2008). This contradicts the classical theory of assimilation that would predict declining fertility across migrant generations and thus strengthens the theory of segmented assimilation (Parrado and Morgan 2008).

The segmented assimilation theory has also been used to describe and explain integration processes of migrant youth of the 1.5 or second generation. Most of these studies focus on migrant-native differences in educational aspirations and actual school performance in the US

(Feliciano 2005; Feliciano and Lanuza 2015), but also in several of the traditional immigration countries in Europe, such as Germany (Relikowski et al. 2012; Salikutluk 2016), France (Yaël Brinbaum and Cebolla-Boado 2007), The Netherlands (Van de Werfhorst and Van Tubergen 2007; Van Ours and Veenman 2003), or UK (Fernández-Reino 2016). In Spain, though, as a relatively new immigrant receiving country, quantitative studies on immigrants' descendants school performance and the resulting differences compared to native adolescents are scarce (Aparicio and Portes 2014; Azzolini et al. 2012; Portes et al. 2010).

While differences between youths of immigrant and of native origin in the field of education has attracted some scholarly attention in European destination countries, differences in other domains of the integration process of adolescents of immigrant origin have largely been neglected. This is the case for preferences for family formation, which have only been studied for the Netherlands (De Valk 2013; De Valk and Liefbroer 2007a, 2007b). Although scholarship has recently tried to contribute to our understanding of the integration processes that children of immigrants are undergoing in new immigration countries such as Spain (Aparicio and Portes 2014), the major focus lies on educational and occupational preferences and outcomes while aspirations towards future family life are rather ignored. Thus, there is a clear gap in research on family life preferences—including union formation and fertility—in European destination countries, and especially in new immigration countries such as Spain.

1.1.3 Selection

A final mechanism used to describe and explain the fertility behaviour of migrants is the *selection or selectivity hypothesis*. Migrants may be selected on observable characteristics, such as education, occupation or socioeconomic status, or on unobservable characteristics, such as social-mobility aspirations (Milewski 2007), openness to innovation (Lindstrom and Giorguli-Saucedo 2002), or high aspirations for children and family proneness (Kulu and González-Ferrer 2014; Lindstrom and Giorguli-Saucedo 2007; Milewski 2007). Migrant selection may imply differential fertility of migrants compared to non-migrants at origin (Kulu 2005; Milewski 2007), and migrants' fertility behaviour may resemble that of

the native population at destination (Kulu and González-Ferrer 2014). According to this hypothesis, migrants do not experience a change in fertility after migrating, but they are already different prior to migration compared to the non-migrants at origin.

The selection hypothesis has been rarely tested empirically, mainly because only few datasets are available that include information on non-migrants at origin as well as migrants. Many migrant surveys that have been conducted at destination also lack information on pre-migration fertility and thus make it impossible to accurately estimate the fertility behaviour of migrant populations and to take into consideration pre- and post-migration fertility. Therefore, most of the studies on selectivity of migrants have been pursued using the case of Mexican migrants in the US, where this kind of data does exist (Choi 2014; Frank and Heuveline 2005; Lindstrom and Giorguli-Saucedo 2002). For Europe, only one recent study compares the fertility of migrants and non-migrants, focussing on the case of Ghanaian migration to Europe (Wolf and Mulder 2017).

The selection hypothesis is mainly used to describe the fertility behaviour of migrants of the first generation. However, this mechanism may also apply to the childbearing patterns of the 1.5 and second generation, namely through parental selective migration. Migrant parents may be positively selected in terms of education or social mobility aspirations for themselves and their offspring (Adserà et al. 2012), which may in turn influence their children's fertility preferences and behaviour.

1.2 Data and case selection: Long-distance intercontinental migration towards Europe

1.2.1 The datasets

Two different quantitative data sources are used for the empirical analyses performed throughout the dissertation. The first is the MAFE survey (*Migrations between Africa and Europe),* which collected retrospective longitudinal life history data of Senegalese migrants of the first generation residing in Spain, France and Italy, and of non-migrants in Senegal between 2007 and 2011, depending on the country. The second dataset is the *Chances Survey*, which interviewed adolescents of Latin American immigrant origin (among other origins), as well as native Spanish youths, using a cross-sectional approach in the city of Madrid in 2011. Thus, the geographic scope of the thesis covers two very different migratory flows.

The selection of migrant groups and destination countries covered by this dissertation is, first of all, data-driven. Very few datasets fulfil the criteria needed in order to perform the analyses that I had in mind. Binational longitudinal data covering origin and destination countries—migrants as well as non-migrants—are scarce. And surveys interviewing immigrant youths in recent immigration countries are also rather rare. The two datasets used are unique in that they provide the necessary sample coverage to do comparative analyses, including individuals with a migratory background against those without—namely non-migrants at origin (MAFE) or natives at destination (Chances). Detailed information on the variables of interest (migration experience as well as fertility timing and quantum (preferences)) is also provided by both data sources. The result is the detailed examination of two migration flows originating from geographically distinct areas and settling in Southern (Spain and Italy) or Western (France) European destination countries.

1.2.2 Empirical relevance

The advantages of analysing Latin American child migrants in Spain and Senegalese migrants to Spain, France and Italy are not only due to the availability of suitable data. These cases also have clear advantages from

an empirical point of view and can contribute to relevant theoretical advances.

Previous research on the descendants of immigrants has focussed mostly on migrants of Turkish and Moroccan origin in Europe's more traditional immigration countries, like Germany or The Netherlands, where these are the largest immigrant groups. Analysing Latin Americans in Spain may contribute to the understanding of the integration of immigrants and their descendants into the receiving societies for several reasons. First, the 'traditional' migrants from Turkey and Morocco towards Western Europe are very different from the European destination societies, not only in terms of their language and religion, but, more importantly, they display a very pronounced cultural and social distance from the native-born populations (González-Ferrer 2007; Kogan 2007). Latin Americans are also the largest origin group residing in Spain, but, in contrast to these older flows, Latin Americans and Spaniards share the same language, Catholic religion and familial values, and the cultural and social distance between the origin and destination societies is lower. Thus, examining two groups with a narrower social distance than the groups previously analysed may offer new insights and contribute to the debate on integration processes of children of immigrants. Second, the (parental) selection processes inherent to the different migratory experiences is clearly different. Turkish guest workers coming to Germany, for example, were often recruited from the poorest and most rural regions in Turkey, with a relatively low socioeconomic background compared to the average origin population (Dronkers and De Heus 2009). This negative educational selectivity has also been found to influence the educational performance of their children (Dronkers and De Heus 2009). In contrast, Latin American migrants to Spain have been found to be positively selected in terms of their educational levels (Castro-Martín and Rosero-Bixby 2011), which may also have an impact on the educational aspirations and performance of their offspring. These differential selection processes between the traditional European destination countries, such as Germany, and the more recent destinations, such as Spain, should also differentially influence the fertility preferences (and possibly future behaviour) of the children of immigrants. In addition to the different immigrant origins, the receiving contexts are also distinct. Southern European destination countries, in particular Spain and Italy, are different

in terms of their immigration policies as well as their immigrant receiving culture compared to the traditional Central and Western European immigration countries. Likewise, the native population that serve as a reference group is different across countries.

While these three points stress the importance of studying migrants and their descendants in new immigration countries and comparing them to the native population, like Latin Americans in Spain, there are also reasons why studying Senegalese migration flows towards Europe is of empirical relevance. There are very few studies that compare the fertility of international migrants and non-migrants at origin, and the large majority of them focus on the analysis of Mexican migrants to the US and those who stay at origin (Frank and Heuveline 2005; Lindstrom and Giorguli-Saucedo 2002, 2007; Singley and Landale 1998). Analysing Senegalese migration flows towards Spain, France and Italy may contribute to the debate on migrant selectivity and widen our understanding of fertility behaviour in the context of international long-distance migration.

Finally, the three empirical chapters of this dissertation make a clear methodological contribution to the study of fertility and migration through the use innovative statistical approaches and methods.

1.2.3 Fertility behaviour and fertility preferences

This dissertation analyses both fertility preferences and fertility behaviour across three chapters. While the above-mentioned mechanisms have been tested empirically only for actual fertility behaviour, it is unclear if and how they apply to fertility preferences. Various studies found that there is a strong positive relationship between fertility expectations and actual future fertility behaviour (Barber 2001; Hayford 2009; Weston and Qu 2004). Using longitudinal data, Barber (2001) demonstrates that fertility attitudes, even of young teenagers, have significant predictive power for future childbearing decisions. However, despite the close relationship between expectations and actual behaviour, both concepts refer to different age groups and expectations can never perfectly predict actual behaviour (Barber 2001). Furthermore, younger people are more likely to adjust their fertility expectations than older people (Iacovou and Tavares

2011; Rackin and Bachrach 2014). Rackin and Bachrach (2014) find that during adolescence, before fertility-related events (such as marriage) have occurred, women's fertility expectations are related to family background, whereas later on, as these fertility related events occur, expectations serve as much better predictors for actual childbearing outcomes.

Although imperfect predictors of future reproductive behaviour, the fertility preferences of immigrants' descendants can provide relevant insights into adaptation processes. The descendants of Latin American immigrants in Spain are still very young (mean age of 9.5 and 17.9 years of the second and 1.5 generation, respectively, in the 2011 Census (INE (Instituto Nacional de Estadística) 2011) and they are far from completing their reproductive phase. Thus, actual differences in fertility behaviour between natives and the descendants of immigrants cannot be examined yet. By analysing their fertility preferences, we can broaden our understanding of fertility adaptation and socialization processes and gain new insights into the 1.5—and also second—generation's future fertility behaviour.

1.3 Outline of the dissertation and specific research questions

The empirical part of the thesis consists of a compilation of three independent research papers presented in Chapters 2 to 4 in this dissertation. Each of the three chapters analyses the link between migration experiences and family formation patterns (or preferences) from a different point of view.

Chapter 2 with the title "Family life trajectories across borders. A sequence analysis approach to Senegalese migrants in Europe" examines partnership and fertility trajectories during the time around migration from Senegal to Europe (Spain, France, Italy). Theoretically, the analysis is based on the disruption and interrelation of events hypotheses. The main research questions guiding the study are how and to what extent male and female migrants' family trajectories diverge in the time before and after migration. Furthermore, the chapter attempts to identify typical

trajectories for both genders and how these are linked to individual and contextual characteristics. The data used in this chapter come from the MAFE project. Using the sequence analysis technique, I constructed individual sequences from five years before to five years after the migration move, accounting for partnership status and the timing and quantum of childbearing. These sequences are then clustered into groups according to their family life trajectories. Five of these clusters could be identified for both male and female migrants. The findings show that fertility is lower—or disrupted—in the time before (for women) and after (for men) migration. Furthermore, for women a strong interrelation of union formation, childbearing and migration could be observed.

Chapter 3 is titled "Fertility behaviour of migrants and non-migrants from a couples perspective: The case of Senegalese migration to Europe". As the title suggests, this chapter analyses fertility behaviour within the couple, comparing Senegalese migrant and non-migrant couples. The main research question asks whether there are differences between migrant and non-migrant couples in terms of fertility timing and quantum. Furthermore, are migrant couples a selected group with differential fertility patterns? Or, rather, are these differences the result of disruption, interrelation of events and adaptation processes? The study is interested in disentangling whether migrant couples with at least one migrant partner are a selected group with differential fertility behaviour, or whether the differences between both are the consequences of the migration process itself. Theoretically, this study has a special focus on the selection hypothesis, but it also builds on the disruption, interrelation of events and adaptation hypotheses. Using the MAFE data, couple histories are reconstructed and event-history and Poisson regression models are used to analyse fertility timing of the first and higher-order births, and the total number of children. The results show that the geographical separation of partners leads to lower birth risks compared to non-migrant couples, but the completed fertility of migrant couples is also lower. I also found marginal evidence for fertility adaptation towards lower fertility levels at destination. However, there remains an unexplained gap between the fertility levels of both groups, which most likely can be explained with fertility selection on unobservable characteristics.

Finally, Chapter 4 is titled "Does migrant background matter for adolescents' fertility preferences? The Latin American 1.5 generation in Spain" and is co-authored with Teresa Castro-Martín (CSIC). It widens our understanding of fertility expectations of adolescent child migrants and the differences compared to native youths at destination. The main research questions addressed in this chapter are: Do adolescents' preferences about their future family size and age at first birth differ by migrant status? And do child migrants gradually adapt their fertility preferences towards those of natives with longer duration of stay at destination? The theoretical framework is based on the adaptation and socialization hypotheses, but we also discuss extensively the implications of parental selective migration. The empirical analysis is based on the Chances Survey. The methods used are OLS and Poisson regression models. The results indicate that Latin American adolescents of the 1.5 generation expect to have their first child slightly but significantly earlier than their native peers. With regard to the expected number of children, there is no significant variation between origins.

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CHAPTER 2:

Family life trajectories across borders. A sequence analysis approach to Senegalese migrants in Europe

Abstract

This article examines the relationship between international migration and family formation trajectories of Sub-Saharan African migrants in Europe. It builds on two of the main mechanisms that link migration with fertility and union formation, namely the disruption and the interrelation of events hypotheses. I use longitudinal data from Senegalese migrants in Spain, France and Italy collected in the framework of the MAFE survey. Applying sequence analysis techniques and distinguishing between genders, individuals are grouped into different clusters according to the (dis-)similarities in their family formation trajectories. Furthermore, multinomial logistic regressions are carried out to test associations between socioeconomic and demographic characteristics and the clusters. For both male and female migrants a five-cluster solution was the best option. The results show that migration-fertility trajectories are in fact different across genders. While for women a disruption in fertility could be observed before migration, for men the opposite was true. Moreover, interrelation of events was more pronounced among women. The regression analysis indicates that age, destination country and work experience are important factors shaping family formation trajectories in the context of international migration.

2.1 Introduction

A growing body of literature is dedicated to the study of migrant fertility behaviour in different geographic settings, addressing different types of migration and providing distinct perspectives on the phenomenon. Most of these studies are based on several partly competing, partly complementary hypotheses (Kulu 2005). The disruption hypothesis affirms that in the time immediately before and after migration, migrants have a low fertility level as a result of economic or psychological stress or spousal separation inherent to the migration process (Kulu 2005). Shortly after migration a "catching-up behaviour" with elevated birth probabilities in order to compensate for interrupted childbearing has been observed (Milewski 2007). According to the interrelation of events hypothesis, migration itself is not the reason for higher childbearing risks after migration, but rather higher levels of fertility are the result of the coincidence of migration and union formation simultaneously (Milewski 2007). Marriage migrants, for whom these two events take place simultaneously, tend to have very fast birth transitions once both partners are in the destination country (Andersson 2004; Lievens 1999; Wolf 2016). The adaptation hypothesis argues that the initial characteristics in fertility behaviour are different in origin and destination countries and over time migrants' behaviour converge to that of the host country (Andersson 2004). The socialization hypothesis stresses the importance of childhood socialization for migrant fertility behaviour. Thus, migrants of the first generation maintain the fertility patterns of the origin country and only subsequent generations, born at destination, converge to the patterns of the natives (Milewski 2007). Finally, the selection hypothesis argues that migrants are a selected group from their country of origin with differential fertility patterns (Milewski 2007).

By concentrating especially on the first two hypotheses—disruption and interrelation of events—this study is interested in the direct interrelations of migration, childbearing and union formation using a holistic perspective. Previous work often focuses on birth transitions in the years following migration by taking an event-centred perspective (Milewski 2007, 2010). However, a more holistic view is needed if one is interested in the entire process of family formation in the context of migration (Kulu and González-Ferrer 2014). This requires analysing union formation, as well as fertility timing and quantum in the time before and after migration, across borders. Specifically, in this study, I address the following three research questions: *How and to what extent do male and female family trajectories diverge in the time before and after migration? Which ideal types can be distinguished for both sexes? How do different trajectories relate to individual and contextual characteristics?*

The main method used in this study is sequence analysis. This technique focuses on the trajectory and the identification of patterns of social processes over time, rather than on discrete transitions as is the case for event history methods (Aisenbrey and Fasang 2010). The use of sequence analysis in social research has increased during the past decade, especially in the field of life course research (Aassve et al. 2007; Berghammer 2012; Billari et al. 2006; Bras et al. 2010; Elzinga and Liefbroer 2007; Sironi et al. 2015). Also in the field of migration research this method is used more and more; however, it has mostly been used to study labour market participation and integration of immigrants at destination (Castagnone et al. 2013; Fuller 2015; Fuller and Martin 2012; Kogan 2007). Only a few studies applied sequence analysis to examine family life trajectories of migrants (Caarls and De Valk 2017; Fulda 2016; Kleinepier et al. 2015; Kleinepier and De Valk 2016). Yet, most of these studies concentrate on the trajectories *after* migration, i.e. when migrants already reside at destination (Kleinepier et al. 2015), or focus on the second generation (Kleinepier and De Valk 2016), or analyse only one dimension of the family formation process, e.g. only relationships (Caarls and De Valk 2017). The exact timing and sequencing of union formation and fertility across borders in the years before and after the migration move has rarely been studied. Furthermore, when individuals are observed only after their arrival at destination, one might have a biased view on family trajectories of migrants, even when longitudinal data are used. The current study adds to the literature on sequence analysis by exploring partnership and childbearing (timing and quantum) trajectories in the immediate time before and after migration by synchronizing family formation trajectories on the event of an individuals' first migration (Colombi and Paye 2014). Hence, male and female migrants are observed before and after migration, instead of examining specific age ranges, as has been done in previous studies.

Senegalese migration to Europe is an interesting case to study family trajectories of male and female migrants. Economic migration from Senegal towards Europe is still male dominated; female migration flows are mainly family-related, either to reunify with their husbands at destination or as marriage migrants. In contrast to other African countries, independent migration of Senegalese women is still rather scarce (Toma and Vause 2013). Thus, male and female family trajectories are differently affected by the migration move and diverging patterns can be expected for both sexes. Many previous studies focused only on migration and fertility of women; however, if one is interested not in the pure demographic consequences that immigrants' fertility behaviour might have on birth rates or population growth in destination countries, but rather the timing and sequencing of these events, men's behaviour should

also be studied. Furthermore, to fully understand family formation and reunification practices both men's and women's behaviour should be accounted for in the analyses.

The empirical analysis draws on survey data collected in the three major European destination countries of Senegalese migratory flows (Spain, France, Italy) in the framework of the MAFE-project (*Migrations between Africa and Europe*). This longitudinal retrospective dataset permits the studying of the trajectories of male and female Senegalese migrants to Europe from several years before to several years after migration. Furthermore, complete histories of union formation and fertility, as well as residential trajectories are available, and thus the MAFE survey serves as a suitable database for applying sequence analysis methods.

2.2 Background

2.2.1 Union formation and fertility in Senegal

Family structures in Sub-Saharan Africa, and especially in Senegal, are complex and diverge from the Western concept of 'family'. Households are large with a mean household size of eight individuals in 2013 (ANSD 2014) and thus may be formed by persons other than parents and their children. Furthermore, individuals may reside in more than one household (Bass and Sow 2006). This kind of 'extended family' as the basic social unit (Baizán et al. 2014) is based on consanguinity, but kinship ties can also be created through marriage or "shared social experience" (Bass and Sow 2006, p. 90). After marriage, wives often move in with their families-in-law; however, frequently the husband does not live there, often because he participates in internal or international migrations (Bass and Sow 2006; Beauchemin et al. 2013).

Marriage and childbearing at early ages is the prevalent social norm (Bass and Sow 2006), especially for women. Among women of the age group 25–29 about 87 per cent are married; this percentage progressively decreases with age, mainly due to widowhood and, to a lower extent, divorce (ANSD 2014). Among men older than 45 years, more than 90 per cent are married. The legal minimum age for marriage is 20 for men and 16 for women, though many girls marry at earlier ages, particularly in rural areas (Bass and Sow 2006). In 2013, age at first marriage was, on average, considerably lower for women compared to men with 22.4 years and 29.9 years, respectively (ANSD 2014). Moreover, 23.1 per cent of the

men have more than one wife at the same time and 44.0 per cent of the women have at least one co-wife, with important differences between rural and urban areas as well as educational levels. Although divorce is relatively common among Senegalese men and women (Antoine and Nanitelamio 1996), only 0.7 and 2.1 per cent of the male and female, respectively, were divorced in 2013 (ANSD 2014). This can be explained with the high proportions of remarriage and, for the men, with frequent polygamous relationships (ANSD 2014). Partner choice is mostly at the extended family level (Bass and Sow 2006) and unions are often formed between cousins (Dial 2008). This kind of arranged marriage is also common among migrant families (Beauchemin et al. 2013). Several factors, such as arranged marriages, spatial separation of partners, large age differences and the practice of polygamy contribute to a social distance between spouses (González-Ferrer et al. 2012; Vives and Vazquez Silva 2016).

With regards to fertility, Senegal resembles other countries in the region (Randall and Legrand 2003) with a total fertility rate of 5.1 children per woman in 2013 (ANSD 2014). Most births occur within marriage and the high fertility levels can be seen as "the cultural desire for large families, the high infant mortality rate, and the low use of modern contraceptive methods" (Bass and Sow 2006, p. 95). As in other Sub-Saharan African countries, Senegalese fertility declines at a relatively slow pace, compared to other developing countries (Bongaarts 2016).

2.2.2 Senegalese migration to Europe

Until the beginning of the eighties, international migrations from Senegal were predominantly intra-continental to other West-African countries, mainly to Mauritania, Mali, Guinea, and Guinea-Bissau (Gerdes 2010). Only from the 1980s on, migratory flows within Africa have been replaced by other destinations. France, the former colonial power, was the first European destination country (Beauchemin et al. 2014). In the beginning, Senegalese were recruited to join the French army, and then many of them stayed to work in the automobile industry. From 1985 on, when economic migration to France became more difficult due to stricter migration policies, migratory flows diversified and were directed also to other destination countries in Europe. In the 1990s, Italy turned into the most important destination within Europe. From the end of the 1990s on, Spain also became an important receiving country for Senegalese migrants (Gerdes 2010). Migration flows from Senegal to Europe are mainly male dominated; independent female migration is on the rise, but still rather uncommon (Toma and Vause 2013).

Family and household structures are interrelated with international migration processes. Family arrangements in the context of migration changed over time. In the beginning of Senegalese migration to France, flows were mainly dominated by male migrants (Barou 2001). In this context, young unmarried men migrated to France and only several years later, after having accumulated a sufficient amount of money, they returned for a visit to Senegal to get married and have the first child. Thereafter, the men often stayed at destination alone, but they visited their families back home in Senegal on a regular basis to have more children and possibly marry other women. Upon the husband's definite return, he is in the privileged position of a polygamous household head with numerous children (Barou 2001). In the late seventies, this family-migration strategy became more difficult due to stricter migration policies (Beauchemin et al. 2013). Furthermore, the left-behind women were not satisfied with the situation of living in the households of their families-in-law, where they were often controlled by their mothers-in-law. In this context, and with relatively loose family reunification laws before 1984, the practice of couple reunification in France emerged (Barou 2001). As a consequence, there is also a rise in reunifications and the birth of children at destination (Gabrielli 2010). The migrants that chose Italy and Spain as their destinations from the 1990s onwards also pursued similar family arrangements.

However, reunification at destination was often seen as a secondary choice and transnational family arrangements were preferred (Baizán et al. 2014). On the one hand, polygamous families with many children were confronted with difficulties related to social integration and the housing situation in receiving societies, and consequently the reunification of polygamous families was forbidden by law (Baizán et al. 2014; Beauchemin et al. 2013). On the other hand, as Senegalese couples are used to living apart and accustomed to a certain social distance between partners, transnational family practices are preferred and long-lasting (Baizán et al. 2014; Vives and Vazquez Silva 2016).

2.3 Theoretical framework and previous evidence

2.3.1 Migration and fertility

Several hypotheses have been developed to explain the relationship between internal and international migration and family formation. These hypotheses can be divided broadly into those addressing the direct interaction of the migration move on fertility timing outcomes in the short run (disruption, interrelation of events), and those comparing fertility differentials and similarities of migrants and the native population at destination in the mid- and long-run (adaptation, socialization). Another hypothesis postulates that immigrants have different fertility outcomes compared to the non-migrants at origin, because they are a selected group from their origin population with differential fertility behaviour (selection). The current study is mainly interested in the first two hypotheses and the direct interaction of migration, union formation and fertility in the short-run, and hence, only these two approaches are discussed further.

The *disruption hypothesis* states that during the immediate time before and after migration, childbearing is disrupted, meaning that no new children are born (Carlson 1985; Lindstrom and Giorguli-Saucedo 2002; Stephen and Bean 1992). Two main reasons for this have been advanced in the literature. First, lower fertility levels during the time of migration can be traced to economic and psychological stress inherent to the migration process and noticeable in the years preceding and following the migration move (Milewski 2007). Births may also be postponed in anticipation of the imminent migration move (Andersson 2004; Lübke 2014; Milewski 2007). Second, for migrants in a partnership the out-migration of one of the partners implies geographic separation of partners leading to lower fertility levels around the time of migration (Andersson 2004; Kulu 2005; Milewski 2007). After migration, high birth rates have been observed, which have been interpreted as 'catching-up behaviour' for disrupted or postponed childbearing (Goldstein and Goldstein 1981; Milewski 2007). However, most studies do not distinguish thoroughly how the disruptive effect of couple separation on fertility may vary by gender of the migrant. In migratory contexts dominated by male economic migrants, like the Senegalese flow, where women—if at all—mostly join their husbands on the basis of family reunification, the disruptive effect of migration should be differential. Male fertility should be disrupted *after* migrating, and females should have lower fertility levels before migrating.

These differential effects by gender of the migrant will be discussed more in detail in the following section.

For migrants, who are single at the time of their migration, low levels of new union formation (Brockerhoff 1995; Ng and Nault 1997) have been found during the first years after migration, which can be interpreted as a disruptive effect of migration on partnership formations. In contexts where fertility occurs mainly within partnerships, the family status at migration is an important predictor for fertility outcomes after migration.

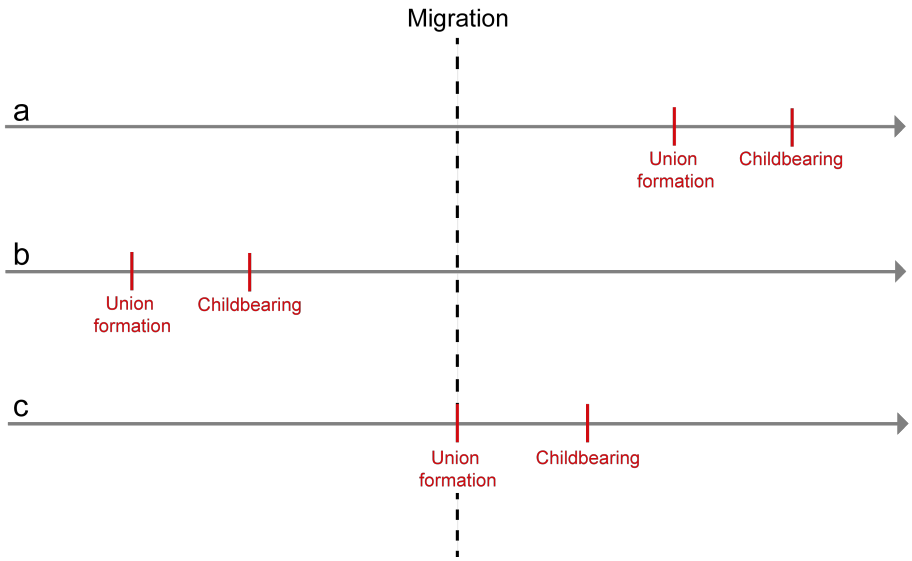
Other authors have interpreted elevated birth probabilities in the immediate time after migration as the coincidence of migration and family formation occurring simultaneously, and both *events are interrelated* (Andersson 2004; Kulu 2005; Lindstrom and Giorguli-Saucedo 2002, 2007; Lübke 2014; Milewski 2007; Mulder and Wagner 1993; Singley and Landale 1998). Hence, migration and union formation are "synchronized" in the life course and mutually influence each other (Mulder and Wagner 1993). Particularly for marriage migrants, union formation is directly linked to migration and both events occur simultaneously. Shortly after the marriage migrant arrives at destination, elevated first-birth risks have been found (Lindstrom and Giorguli-Saucedo 2002; Wolf 2016). The interrelation of events hypothesis has been tested empirically for internal and international migrants and in different migratory contexts (Andersson 2004; Kulu 2005; Lindstrom and Giorguli-Saucedo 2002, 2007; Milewski 2007). Shortly after the migration of the woman and reunification at destination the newly-formed couple tends to experience elevated first birth risks (Lievens 1999; Lindstrom and Giorguli-Saucedo 2002; Wolf 2016). For African migrant women in Catalonia (Spain), Devolder and Bueno (2011) also found an interrelation of migration and fertility, with a strong arrival effect shortly after migration.

2.3.2 Family life strategies of male and female migrants

The study takes an exploratory and descriptive approach and has the aim of understanding the process of union formation and childbearing in the years preceding and following migration of male and female migrants. For both men and women several trajectories are possible, each implying a different order/sequencing of union formation and childbearing in relation to the migration move. The linkage between migration and family life events depends on the stage in the family life cycle of the migrant. The two hypotheses on migrant fertility described above serve as a basis to explain how family trajectories of Senegalese migrants to Europe may evolve before and after migration, and which gender differences may

appear. I distinguish between three possible strategies, each referring to a different family trajectory in relation to migration (see Figure 1 for a graphic representation.

Figure 1. Family-migration strategies: Sequencing of family formation and migration events in the life course



Source: own elaboration.

Strategy a: Migration before union formation

Firstly, at the time of migration, individuals may be childless singles, who had not yet started their family life. Hence, the migration move does not interact directly with partnership formation and childbearing patterns, since these events occur at different points in time throughout an individual's life course. Men and women likewise may pursue this strategy of migrating before forming a family. Yet, Senegalese migration to Europe is still a rather male-dominated activity, and female independent migration is rather uncommon (Toma and Vause 2013). Therefore, the strategy of single childless migrants is expected to be frequent for male migrants, and rather rare among female migrants. Once at destination, Senegalese single men tend to remain in this family situation for several years after migration due to a skewed sex ratio

towards males and therefore a scarcity of single Senegalese women in European destination countries. Upon accumulating sufficient economic resources to start building a family, men might get married at a distance or during a visit back home in Senegal. This means that for single migrants the migration may have a disruptive effect on union formation, due to the lack of suitable partners at destination. In short, trajectories of single migrants are expected to be more frequent among men, and union formation and childbearing tend to begin several years after the migration move to Europe. In fact, childless single migrants are expected to be younger than those migrants who already have a family at time of migration.

Strategy b: Union formation before migration

Secondly, migrants may already be in a relationship and have one or more children at time of their migration. The out-migration of one of the partners leads to disrupted fertility due to couple separation. Both, male and female migrants may follow this strategy, but in the Senegalese context, where the man is mainly the pioneer partner, the impact of migration on fertility outcomes should be different across genders. Consequently, male migrants from Senegal, who are in a union at time of migration, should have fewer children in the time after their move due to the geographic separation from their wives. These transnational family arrangements can be long-lasting (Baizán et al. 2014), and the birth of any subsequent child may be delayed for several years. Only after reunification of the spouses either at destination or origin, or during visits at home, can further children be conceived. Thus, after migration there should be a clear disruptive effect on childbearing of male solo or pioneer migrants.

In contrast, female migrants' fertility trajectories should be disrupted in the time before migration. As Senegalese women mainly follow their husbands to Europe, they do not have any further children in the time preceding their own migration due to the geographic separation from their husbands who are already at destination. After women's migration to Europe, a catching-up behaviour in fertility can be expected (Goldstein and Goldstein 1981; Milewski 2007), as women make up for the postponed and/or disrupted childbearing during couple separation. To sum up, male and female migrants may be in a relationship and have one or several children when they migrate, although the disruptive effect of migration on the birth of any additional child is expected to vary by sex: male fertility should be disrupted after migration whereas female fertility should be disrupted before their move.

Strategy c: Simultaneous union formation and migration

Thirdly, union formation and migration may occur simultaneously, as predicted by the interrelation of events hypothesis. As marriage migration is a common practice among Senegalese women (Baizán et al. 2014), for them migration to Europe and union formation should be interrelated. Another common practice among the Senegalese are union formations at a distance, thus partnerships that are formed across borders, while both partners live in different countries (Baizán et al. 2014), and some time later they may reunify at destination. For the Senegalese, the man usually already resides in Europe and the woman joins him later. In this case, union formation is not directly interrelated with the act of migrating for women or for men—often several years may lie between union formation at a distance and migration; but once the wife migrates to Europe the couple is expected to have a fast transition to a (first) birth shortly after her migration move. Hence, migration and childbirth represent interrelated events. In summary, the interrelation of union formation, childbearing and migration should be stronger for female migrants than for their male counterparts.

2.4 Data and methods

2.4.1 Data

To study how family formation trajectories evolve in the years around migration, longitudinal life-history data including information on union formations, childbearing and residential histories covering the period before and after migration are required. The MAFE survey (*Migrations between Africa and Europe*)[1] provides this kind of information on a yearly

[1] The MAFE project is coordinated by INED (C. Beauchemin) in partnership with the Université catholique de Louvain (B. Schoumaker), Maastricht University (V. Mazzucato), the Université Cheikh Anta Diop (P. Sakho), the Université de Kinshasa (J. Mangalu), the University of Ghana (P. Quartey), the Universitat Pompeu Fabra (P. Baizan), the Consejo Superior de Investigaciones Científicas (A. González-Ferrer), the Forum Internazionale ed Europeo di Ricerche sull'Immigrazione (E. Castagnone), and the University of Sussex (R. Black). The MAFE project has received funding from the European Community's Seventh Framework Programme under grant agreement 217206. The MAFE-Senegal survey was conducted with the financial support of INED, the Agence Nationale de la Recherche (France), the Région Ile de France and the

basis and is therefore suitable for the empirical analysis. In the framework of the Senegalese part of the MAFE project, longitudinal life-history data of non-migrants and migrants were collected in Senegal and the major European destination countries (Spain, France, Italy). In 2008, about 200 current Senegalese migrants were interviewed in Spain, France and Italy, respectively. Furthermore, some 1,000 individuals were interviewed in Senegal. In Spain, another round of surveys were conducted in 2011. This second round of interviews, called MESE (*Migraciones Entre Senegal y España*), adds 405 individuals to the sample of Senegalese migrants in Spain. Overall, the complete sample covers life histories of 2,073 men and women, including information on the timing and sequencing of migratory trajectories as well as fertility and partnership histories.

Different sampling strategies were applied to select the respondents. In Spain, the municipal population register (*Padrón*) served as a national sampling frame, allowing researchers to draw a random sample of undocumented and documented Senegalese migrants. Since in France and Italy no such a sampling frame exists, a non-probabilistic quota sampling technique was used. All interviewees had to be aged 25 to 75, born in Senegal, have Senegalese citizenship, and have migrated to Europe at age 18 or later for a stay of at least one year to be eligible to participate in the survey. Men and women each represented 50 per cent of all surveyed individuals in each country and half of the individuals of each sex were aged between 25 and 40, and the other half between 40 and 75 (Beauchemin and González-Ferrer 2011). For the sequence analysis, the data are weighted to account for the different sampling procedures employed across different countries (for a detailed description of the weighting strategies see Schoumaker and Mezger 2013).

2.4.2 Analysis sample

Since I am interested in the variability of family formation trajectories of male and female migrants, individuals who never migrated to Spain, France or Italy were dropped from the sample (N=1008). This includes non-migrants, but also individuals who only migrated to other (European) countries, since sample sizes are too small to draw valid conclusions on migrants to these other destinations. Furthermore, only direct migrations from Senegal to one of the three European destinations are considered; individuals who stayed for at least one year in any other country before continuing their migration towards Spain, France or Italy were also excluded (N=78). For migrants who migrated more than once to one of

FSP programme 'International Migrations, territorial reorganizations and development of the countries of the South'. http://mafeproject.site.ined.fr/en/

the three European countries, only the first migration move is considered.[2] Nevertheless, individuals might have experienced one or more previous migrations, but to other non-European countries. Moreover, the sample is restricted to migrants who migrated to the respective destination country between age 18 and 45 or 55 years, for women and men, respectively. The lower age limit was chosen because respondents had to have migrated at age 18 or older in order to be eligible for the MAFE survey, and the upper age limit marks the age up to which most family transitions occur. 25 individuals migrated after age 45/55 and thus were dropped from the sample. Different upper age limits for men and women were established, since men are able to have children up to higher ages compared to their female counterparts and age differences between partners are relatively high in Senegal (ANSD 2014; Antoine and Nanitelamio 1996; Marchetta and Sahn 2015). In 2013, the mean age at marriage was 22.4 for women and 29.9 for men (ANSD 2014). Return migrants were also dropped from the sample (N=50). The remaining sample includes life histories of 470 men and 442 women.

2.4.3 Methods

Sequence analysis (SA) is applied to analyse family formation trajectories during the time before and after migration. This method—originally coming from biology and implemented in the social sciences by Abbott (1995)—uses trajectories as the unit of analysis, enabling the identification of prevalent patterns within these sequences (Stovel and Bolan 2004). In so doing, it allows for the analyse of life course trajectories while taking into account timing, sequencing, and quantum (Billari et al. 2006). In short, "SA models processes" (Gauthier et al. 2014, p. 1). Furthermore, ideal types or typologies of trajectories can be identified by clustering individuals into different groups (Aassve et al. 2007).[3]

In most of the existing studies in life course research that apply SA, sequences are displayed in age-relative time (Aassve et al. 2007; Kleinepier and De Valk 2016; Sironi et al. 2015), for example observing individuals from age 18 to 40. The current study, however, uses an event-related timeframe, as I am interested in how structural patterns (union

[2] This study only analyses direct first-time migration from Senegal to Europe. More complex migration strategies—such as stepwise, circular or return migration (Liu 2013)—are beyond the scope of this paper.

[3] For a more recent review of the SA technique and its implications see Aisenbrey and Fasang (2010) and Blanchard et al. (2014).

formation, fertility) are linked to a specific event (migration). This approach, called "sequence synchronization", defines the time axis of each individual sequence according to the time preceding or elapsed after a certain event (Colombi and Paye 2014). In so doing, the sequence data are synchronized on the event of first migration from Senegal to Spain, France or Italy. The time axis has been delimited to five years before migration to five years after migration and the year of migration is included as a separate year. Thus, individuals are observed during a total period of eleven years. After careful consideration, the remaining sample was restricted to respondents for whom data for the complete 11-year period were available, which was the case for approximately 70 per cent of the men and women. Before dropping individuals with unequal sequences, the mean sequence length was 10.3 both for men and women. Missing values are a serious problem for sequence analysis inherent to most longitudinal surveys (Martin et al. 2008). In the case of the MAFE survey, variations in length of the sequences are the result of censored data, since about 30 per cent of the migrants migrated to Europe less than five years before the survey was carried out. Consequently, they could not be observed during the full period of five years after migrating and thus missing values were coded. Sequences of unequal length, i.e. shorter than 11 years, were therefore dropped from the sample resulting in a final analytical sample size of 315 women (weighted N=198) and 332 men (weighted N= 479).[4] Figure 1 in the Appendix shows the index plot of the sample before dropping the incomplete sequences.

In order to analyse family trajectories, two variables were combined: *relationship status* (single, in a relationship[5]) and the *number of children*[6] (0, 1, 2, 3+). The final alphabet contains six mutually exclusive states, which are used to perform sequence analysis. Table 1 shows an overview of the different states. At each point in time throughout the 11-year period each individual belongs to one of these states.

[4] Since the length of the sequences might not be randomly distributed among individuals, a robustness check was performed for the entire sample including also the sequences of shorter length (i.e. sequence lengths between 6 and 11 spells). Furthermore, another test was carried out coding the missing values as a separate state in SA. Both robustness checks showed very similar results. Also the five clusters for men and women were substantially very similar to the ones identified by only using the complete sequences.

[5] Due to the practice of polygamy, for men 'in a relationship' can be interpreted as having at least one partner.

[6] Retrospective birth histories have been found to underreport fertility, which is particularly the case for men (Rendall et al. 1999) and older individuals (Murphy 2009). Yet, it is not expected that these inaccuracies affect the results.

Table 1. Sequence analysis alphabet: Possible states defining individual sequences

State	Description	Acronym
1	Single, childless	S0
2	Single, 1 or more children	S1+
3	In a relationship, 0 children	R0
4	In a relationship, 1 child	R1
5	In a relationship, 2 children	R2
6	In a relationship, 3 or more children	R3+

Source: own elaboration.

In the next step, Optimal Matching (OM)[7] distances between all sequences are computed, for men and women separately. The OM algorithm detects the dissimilarities between two given sequences and calculates the cost that is needed to match the sequences (Abbott 1995; Abbott and Hrycak 1990; Aisenbrey and Fasang 2010). Possible operations are insertion-deletion ('indel') and substitution of states. To set the costs for these three operations I opted for a constant indel cost of 1 and substitution costs based on transition rates, which is in line with previous studies (Aassve et al. 2007; Kleinepier et al. 2015). This data-driven approach reduces the subjectivity in the cost-setting process, which is one of the major critiques of OM (Aassve et al. 2007).[8] Other indel and substitution costs were tried (e.g. a indel cost of 2), but the results were substantially similar.

After calculating the distances, the sequences are clustered according to their family trajectories using the Partitioning Around Medoids (PAM) algorithm (Kaufman and Rousseeuw 1990; Kleinepier et al. 2015; Studer 2013). This method partitions the sequences into a predefined number of groups by identifying the best representative sequence of each group, called the "medoid" sequence (Studer 2013). A medoid is the sequence within each cluster with the minimum distance from all of the other

[7] As a robustness check, also Elzinga's Longest Common Subsequence (LCS) measure for calculating distances between sequences has been applied (Elzinga 2003, 2010) leading to very similar results.

[8] Other strategies for setting substitution costs in the social sciences are a unit substitution cost matrix, or costs based on theory (Martin et al. 2008)

sequences in the same cluster. Hence, each cluster is defined based on a sequence that best represents the group (Barban 2013). The individual represented by the medoid is thus a real person that is used as an ideal type (Aassve et al. 2007). Since the number of clusters has to be defined in advance, several cluster solutions have been tested, both for men and female trajectories independently. The Average Silhouette Width criterion (ASW; Kaufman and Rousseeuw 1990) is used to determine the final number of clusters for men and women based on the quality of the partitions. The sequence analysis has been carried out using the packages *WeightedCluster* (Studer 2013) and *TraMineR* (Gabadinho et al. 2011) in the open source statistical software R. All the different steps described apply survey weights.

Finally, cross-sectional multinomial logistic regression models are performed to analyse how the resulting clusters for men and women are related to individual socioeconomic and demographic characteristics (Berghammer 2012; Potarca et al. 2013; Sironi et al. 2015). Thus, for both men and women the identified clusters become a categorical dependent variable. Due to the rather small sample sizes within each cluster, only a limited number of explanatory variables could be included in the regressions. The descriptive statistics for these variables are shown in Table 2.

Age: Measured at time of migration.

Period: This categorical variable measured in the year of migration indicates whether the respondent migrated before 1985, between 1985 and 1993, or in 1994 and later. These time periods were chosen because France introduced a compulsory visa requirement for the Senegalese in 1985, and in 1994 Senegal was hit by a severe economic crisis (Liu 2013).

Education: A dummy variable that measures whether the respondent has at least some secondary education, or he/she has only primary or no education. In most Sub-Saharan African countries, fertility patterns (Bongaarts 2003; Marchetta and Sahn 2015; Schoumaker 2004) as well as migration strategies (González-Ferrer et al. 2014; Shaw 2007; van Dalen et al. 2005) and family reunification practices (Baizán et al. 2014; Beauchemin et al. 2015; Toma and Vause 2013) are strongly related to the educational level of an individual.

Employed: This continuous variable refers to the number of years the respondent was employed throughout the 11-year period used for the SA (Caarls and De Valk 2017). In Senegal, with its rigid patriarchal system, work experience is an important measure for female autonomy.

Destination country: A categorical variable distinguishing between the three European destination countries: Spain, France and Italy.

Table 2. Descriptive statistics for independent variables by sex, analytical sample

		Male		Female		Total	
		N	%	N	%	N	%
Age at migration (mean years)			21.8		21.8		21.8
Period	*Before 1985*	89	32.1	41	25.4	130	30.1
	1985-1993	98	26.3	114	29.2	212	27.1
	1994 and later	145	41.6	160	45.4	305	42.7
Education	*At least some primary or none*	145	38.9	147	36.5	292	38.2
	At least some secondary	187	61.1	168	63.5	355	61.8
Employed (mean years)			8.4		5.0		7.4
Destination country	*Spain*	151	27.4	184	13.6	335	23.3
	France	82	34.3	75	75.5	157	46.3
	Italy	99	38.4	56	10.9	155	30.3
N		**332**	**70.8**	**315**	**29.2**	**647**	**100.0**

Data: MAFE-MESE Biographic Survey. Weighted percentages.

2.5 Results

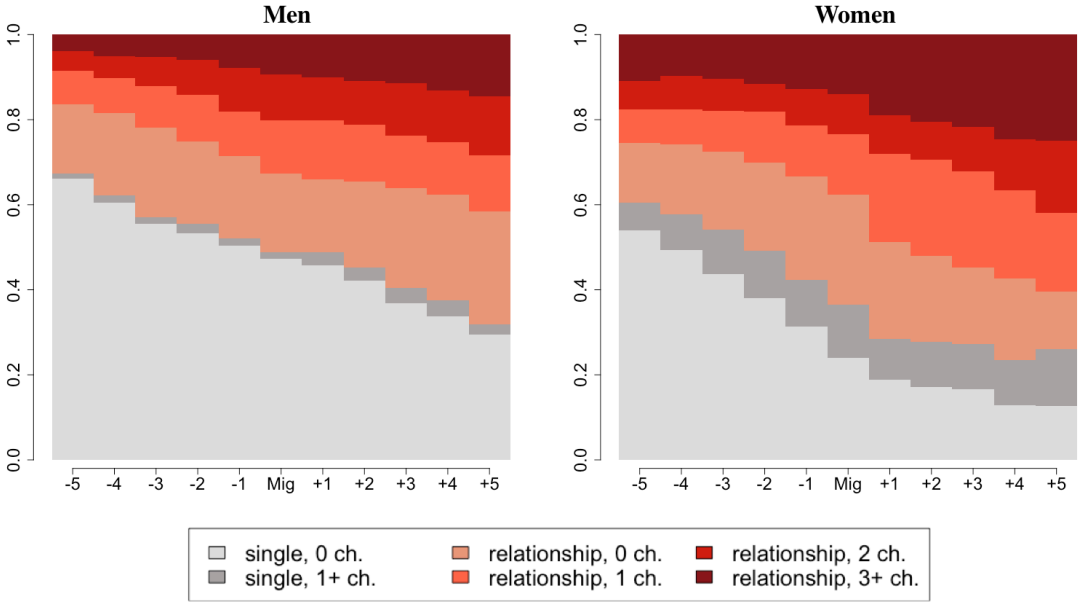
2.5.1 Sequence analysis

In the first step of the analysis, the sequences for the final sample of male and female migrants were constructed. Out of the 332 sequences for men, 146 (44 per cent) were distinct, and for the 315 women, 181 (57 per cent) sequences were different. Figure 2 shows the aggregated distribution of states for men and women throughout the 11-year period.[9] At first glance, important differences by gender appear, which is also confirmed by a test for dissimilarity between male and female trajectories (significance of dissimilarity: $p<0.001$). About half of all male migrants are childless

[9] Note that distribution plots do not show individual sequences, but rather an aggregated picture of "transversal characteristics" (Gabadinho et al. 2011). Figure 5 in the Appendix shows the individual sequences/trajectories (including incomplete sequences).

singles at time of migration, whereas only 20 per cent of the women are single without children. For women, migration seems more interrelated with family formation trajectories than is the case for men. Especially in the year of migration many women enter a union and many of them have a first child in the years after, indicating that marriage migration seems a common strategy for Senegalese women in order to migrate to Europe. Moreover, mothers of one or more children who are already in a relationship before migration have a fast transition to a subsequent child in the years following the move, indicating a catching-up behaviour found in previous studies for other migratory contexts (Bledsoe et al. 2007; Goldstein and Goldstein 1981; Milewski 2007). Apparently, for men the negative effect of the geographic separation of partners on fertility is noticeable after migration, whereas for women it begins to operate before migration. Thus, as expected, in the context of male-initiated migration strategies, fertility disruption due to migration has a differential effect by gender, as men are the ones who migrate first and women, if at all, tend to join their husbands later. Another interesting pattern is the relatively large share of single mothers, which appears equally before and after migration. In contrast, single fathers are very rare throughout the entire period of observation.

Figure 2. State distribution plots for male and female migrants.



Data: MAFE-MESE Biographic Survey. Weighted.

In the next step, the OM distances between the individual sequences are calculated, for men and women separately, creating a matrix of dissimilarities. Based on this matrix, the sequences are grouped into clusters using the Partitioning Around Medoids algorithm. Following Stovel and Bolan (2004), I selected a solution that restricted the number of clusters to a manageable size, avoided solutions with clusters composed of only a few individuals (N<30), and intended that the clusters were relatively homogenous. These conditions, combined with the Average Silhouette Width criterion (ASW men: 0.58; ASW women: 0.43) and the graphical representation of clusters, suggested a five-cluster solution for both men and women. Coming up with the same number of clusters for both sexes was not intended, but, independently, this was the most reasonable solution for both genders based on the mentioned criteria. The labelling of each cluster refers to the most prevalent trajectory within each cluster. Moreover, the numbering of the clusters does not correspond to their relative frequency, but clusters are ordered according to the stage in the family life cycle illustrated in each cluster.

Table 3. Description and medoid sequence of male and female clusters

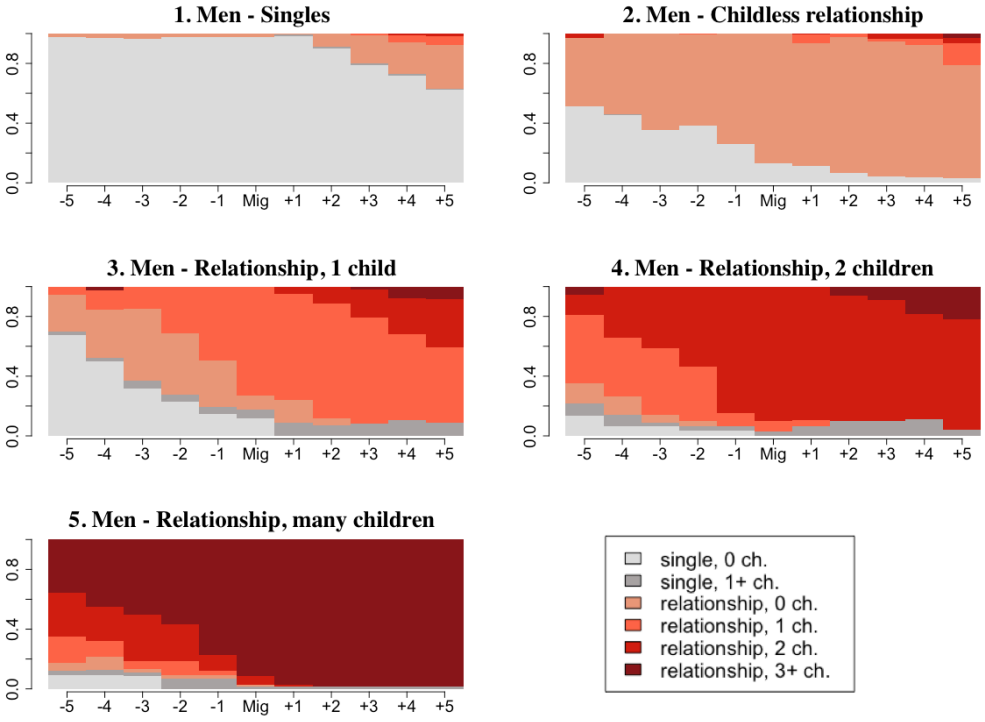
Number	Cluster description	Medoid sequence	%	N
Men				
1	Singles	S0-S0-S0-S0-S0-S0-S0-S0-S0-S0-S0	46	145
2	Childless relationship	S0-S0-R0-R0-R0-R0-R0-R0-R0-R0-R0	17	52
3	Relationship, 1 child	S0-S0-R0-R0-R1-R1-R1-R1-R1-R1-R2	16	57
4	Relationship, 2 children	R1-R1-R1-R2-R2-R2-R2-R2-R2-R2-R2	10	33
5	Relationship, many children	R2-R3+-R3+-R3+-R3+-R3+-R3+-R3+-R3+-R3+-R3+	11	45
Total			**100**	**332**
Women				
1	Singles	S0-S0-S0-S0-S0-S0-S0-S0-S0-S0-S0	15	46
2	Single mothers	S1+-S1+-S1+-S1+-S1+-S1+-S1+-S1+-S1+-S1+-S1+	12	31
3	Childless relationship	S0-S0-S0-S0-S0-R0-R0-R0-R0-R0-R0	20	44
4	Relationship, 1 child	S0-S0-S0-R0-R0-R0-R1-R1-R1-R1-R2	29	107
5	Relationship, many children	R2-R2-R2-R3+-R3+-R3+-R3+-R3+-R3+-R3+-R3+	24	87
Total			**100**	**315**

Data: MAFE-MESE Biographic Survey. Weighted percentages.

The state distribution plots of the clusters for men and women are presented in Figure 3 and Figure 4 (Figures 6 and 7 in the Appendix show the mean time spent in each state for each cluster). Table 3 presents the

proportions and sample sizes of men and women in each cluster, as well as their medoid sequences. First the male clusters are discussed. The first cluster—*Singles*—covers the biggest number of men in the sample including almost half (46 per cent) of the Senegalese migrants. As shown by the medoid sequence (S0, 11) most of these men are childless singles throughout the observed period. Only some of them enter a union several years after migration. Cluster 2—*Childless relationship*—is the second largest group (17 per cent) and is dominated by men who are in a relationship, but have not yet had any children. Given the Senegalese context, where childlessness within unions is rather rare since most couples have a fast transition to a first child shortly after union formation, this family life trajectory seems related to male out-migration. These men might begin a partnership either a few years preceding migration, or once at destination they get married transnationally at a distance or during a short visit in Senegal. In both cases fertility—the birth of the first child—is disrupted due to the long-distance geographic separation of both partners. Clusters 3, 4 and 5 are similar in that childbearing seems to be accelerated in the years preceding migration, but in each cluster the men are at different stages in the family life cycle. The third cluster—*Relationship, 1 child* (16 per cent)—is defined by men who initiate a relationship and have a fast transition to a first child a few years before migration. Cluster 4—*Relationship, 2 children* (10 per cent)—includes men who have a second child just before migrating, many of them just one year before or in the same year of migration. And finally, the fifth cluster—*Relationship, many children* (11 per cent)—shows trajectories of men who already have several children, many of them having the third child just before migration. Note that for clusters 3, 4 and 5 no causal interpretation can be given, since the results are merely descriptive. It is not clear, therefore, whether men initiate a relationship and have a first or subsequent child in anticipation of the imminent migration, or whether the fact that they have an additional child determines the decision to migrate (Lindstrom and Giorguli-Saucedo 2007). Regardless, Senegalese men are either singles at migration and thus the event of migration does not interrelate directly with their family life trajectories, or they have an accelerated family life in the years preceding migration and a rather postponed or disrupted fertility after migration.

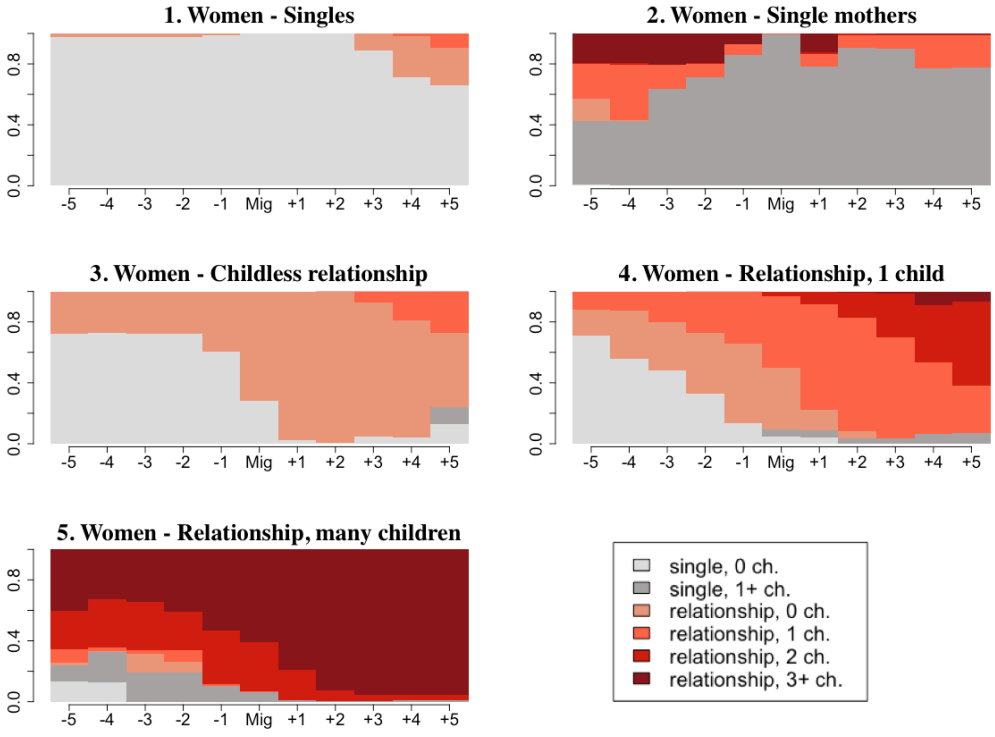
Figure 3. State distribution plots of 5-cluster solution, male migrants.



Data: MAFE-MESE Biographic Survey. Weighted.

Turning now to the clusters for women, the first cluster—*Singles* (15 per cent)—is very similar to Cluster 1 for men, only that childless singles are much less frequent among women. Independent female migrants from Sub-Saharan Africa to Europe are still scarce and have been found to be very selected in terms of education, especially for strongly patriarchal societies like Senegal (Toma and Vause 2013). Cluster 2—*Single mothers* (12 per cent)—is a unique group that I did not find for men. The distribution plot illustrates that most of these women become single in the years prior to migration after having been in a relationship. This is an interesting result, since earlier studies mostly found that international migration may lead to union dissolutions of female migrants (Caarls and Mazzucato 2015; Hill 2004; Landale and Ogena 1995; Zontini 2010), and thus this finding indicates that the opposite may also occur. However, again, the causal link between migration and union disruption is not clear, as partnerships may have ended in anticipation of the upcoming migration of these women. The third female cluster—*Childless relationship* (20 per cent)—is dominated by women who get married in the year of migration or the following year. These women may be marriage migrants, which is a common strategy among Senegalese women in the context of international migration to Europe. Migration and union formation are two interrelated events occurring at the same time. Interestingly, most of these 'imported brides' (González-Ferrer 2006; Lievens 1999) do not have a first child during the time immediately after migration, as has been found for other migratory contexts (Lievens 1999; Wolf 2016). These women slowly start having children after three years or more. However, Cluster 4—*Relationship, 1 child* (29 per cent)—does show the pattern of a very fast transition to a first birth shortly after migration, and, in some cases, an equally fast progression to a second child afterwards. This is the most common trajectory among Senegalese female migrants followed by nearly 30 per cent of the women. Many of these women might have married a current migrant at a distance before reunifying with him in Europe. For these women, family life trajectories are also strongly interrelated with their migration experience. Finally, Cluster 5—*Relationship, many children* (24 per cent)—is dominated by women with several children. These women have family trajectories in more advanced stages, as most of them already have three or more children throughout the observed period. These women probably join their husbands in Europe at an older age after achieving—or being close to—their reproductive goals. In sum, the majority of Senegalese female migrants are in a union at the time of migration and once at destination they have a fast transition to a first or subsequent child when they are at the beginning of their reproductive career. Childbearing, and especially union formation, seem strongly interrelated with the migration move.

Figure 4. State distribution plots of 5-cluster solution, female migrants.



Data: MAFE-MESE Biographic Survey. Weighted.

2.5.2 Multivariate results

From the previous analysis, it seems that age is crucial in determining whether an individual belongs to one cluster or another. To verify this impression statistically, as well as to see which other socioeconomic or demographic characteristics may be important to explain the variations in trajectories, I performed multivariate multinomial logistic regressions to provide a broad overview of which characteristics are related to each cluster. This analysis is performed to test associations between family life trajectories, migration and other individual characteristics, without assuming a causal relationship. For both men and women the dependent variable is categorical, with five possible outcomes—one for each cluster. The base outcome—or reference category—is the single trajectory (Cluster 1 for males and females, respectively).

The regression coefficients are presented in Tables 4 and 5. Beginning with men, as expected, the respondent's age is an important determinant of the stage in the family life cycle at migration to Europe. Men pertaining to the single trajectory (male Cluster 1) are significantly younger compared to all other trajectories. With regard to the period effects, those migrating after 1993 are more likely to have already started family life compared to those who migrated earlier, although only the coefficient for Cluster 2 reaches statistical significance. This can be explained with the fact that in the 1980s, when Senegalese migration to France emerged, the migratory flows were mainly dominated by male singles. Surprisingly, single migrants do not stand out significantly from the other clusters with regard to educational level. Furthermore, only men who already have several children when they migrate (Cluster 5) have a significantly higher number of years of economic activity during the 11-year observation period compared to singles. This may be interpreted as a matter of age—as these migrants are significantly older than the single cluster. Nevertheless, this variable is more informative in the case of women, as will be shown in the remainder of this article. In regard to destination countries, men who are already in a union—with or without children, are more likely to migrate to Italy compared to migration to France. Thus, France is the preferred destination for single male migrants, while migrants who are already in a more advanced stage in their family life trajectory are more likely to choose Italy as their destination. Migrants to Spain seem not significantly different from those migrating to France with respect to their family life trajectory. This is in line with the changes in the Senegalese migration history over time, since at the onset mainly single men migrated to France.

Table 4. Multinomial logistic regression analyses for male migrants. Relative risk ratios.

		1. Singles (base outcome)			
		2. Childless relation-ship	**3. Relationship, 1 child**	**4. Relationship, 2 children**	**5. Relationship, many children**
Age		1.14***	1.23***	1.33***	1.43***
		(0.05)	(0.05)	(0.06)	(0.07)
Period (Ref: before 1985)	*1985-1993*	0.57	0.78	0.92	2.41
		(0.30)	(0.38)	(0.61)	(1.84)
	1994 and later	2.15*	1.41	1.84	2.32
		(0.92)	(0.64)	(1.12)	(1.79)
Education (Ref: primary or less)	*Secondary*	0.57	0.82	1.07	1.70
		(0.23)	(0.32)	(0.52)	(0.81)
Employed		1.05	1.12	1.16	2.14***
		(0.07)	(0.08)	(0.11)	(0.59)
Destination (Ref: France)	*Spain*	0.52	1.00	0.50	1.15
		(0.25)	(0.51)	(0.29)	(0.86)
	Italy	2.27*	2.95**	1.12	4.39*
		(1.06)	(1.55)	(0.74)	(3.47)
N		332			
Pseudo R^2		0.20			

Data: MAFE-MESE Biographic Survey, unweighted; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; *Note:* Exponentiated coefficients; Standard errors in parentheses.

Turning now to female trajectories, age also appears to be an important factor related to women's family trajectories in the context of international migration. Single mothers (Cluster 2) and women in a relationship and with several children (Cluster 5), are significantly older compared to single migrants. Furthermore, female single migrants are more likely to migrate after 1985 compared to women with a partner and/or children. This is not surprising as independent migration of single women is a rather new phenomenon. Single childless migrant women are more highly educated compared to women with three or more children. Likewise, single women, independent from having children or not, have more work experience, as they have been economically active for more years compared to the other groups. This shows that women who initiate their own migration—i.e. do not follow their husbands—are a selected group that seems to also be economically independent. With regard to destinations, only single mothers are significantly different from childless singles in that they are less likely to choose Italy compared to France as their preferred destination.

In sum, family trajectories of male and female Senegalese migrants to Europe are linked to several factors, such as age, work experience (especially for women) and the country of destination. Surprisingly, education seems not a major characteristic related to family life strategies in the context of Senegalese migration to Europe. Although no causal relationships can be established, the multinomial logistic regressions can provide an idea of the diversity of migrant family trajectories and how these are differentially related to individual socioeconomic and demographic characteristics.

Table 5. Multinomial logistic regression analyses for female migrants. Relative risk ratios.

		1. Singles (base outcome)			
		2. Single mothers	**3. Childless relationship**	**4. Relationship, 1 child**	**5. Relationship, many children**
Age		1.31***	1.09	1.06	1.38***
		(0.07)	(0.06)	(0.05)	(0.07)
Period	*1985-1993*	0.18**	0.14***	0.69	0.23**
(Ref: before 1985)		(0.16)	(0.10)	(0.45)	(0.17)
	1994 and later	0.26	0.51	0.93	0.22**
		(0.22)	(0.36)	(0.62)	(0.17)
Education	*Secondary*	0.39*	0.58	0.65	0.28***
(Ref: primary or less)		(0.22)	(0.29)	(0.27)	(0.13)
Employed		0.91	0.78***	0.78***	0.75***
		(0.07)	(0.06)	(0.05)	(0.05)
Destination	*Spain*	0.80	0.77	2.27	1.71
(Ref: France)		(0.50)	(0.43)	(1.15)	(0.99)
	Italy	0.14**	0.43	0.86	0.65
		(0.13)	(0.28)	(0.47)	(0.44)
N		315			
Pseudo R^2		0.20			

Data: MAFE-MESE Biographic Survey, unweighted; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; *Note:* Exponentiated coefficients; Standard errors in parentheses.

2.5 Conclusion

Family trajectories depend on the interrelation of various factors in different domains over the course of an individual's life. Apart from the social, economic and biological contexts, migration may be a factor that shapes family formation patterns. This study makes a deeper understanding of a complex phenomenon possible: trajectories of union formation and childbearing in the context of international migration from Sub-Saharan Africa to Europe.

The aim of this article was to provide a holistic view of union formation, fertility and migration trajectories of Senegalese migrants in Europe. Five different clusters/ideal types could be identified both for male and female migrants. All clusters share the common characteristic that the decision to migrate seems to be an integral part of the family formation process for both men and women. The three possible strategies for interactions between family formation and the migration process could be identified with the data at hand. The first strategy—migration occurs before union formation—could be found for women and particularly for men (male and female Cluster 1, *Singles*). Almost one half of all male migrants and 15 per cent of the female migrants follow this trajectory. For both genders, family formation begins only several years after the migration move and hence, no direct interaction of migration and family formation could be observed.

The second strategy—union formation before migration—is the predominant order of events among all other male clusters, with the men simply in different stages of their family life cycle across the different clusters. Thus, men are in a relationship at the time of migration, and they are childless (male Cluster 2), have one child (male Cluster 3), have two children (male cluster 4), or have three or more children (male Cluster 5). After migrating, the state distribution plots show a clear disruptive effect on the births of the first or a subsequent child. Hence, it seems that the separation from their wives and transnational family arrangements are long-lasting, which is in line with previous studies on Senegalese reunification practices (Baizán et al. 2014). In contrast, only two female trajectories follow the sequencing of events of the second strategy, namely Cluster 5 (*Relationship, many children*) and to some extent also Cluster 4 (*Relationship, 1 child*). The fourth cluster shows that although many unions are formed—possibly at a distance—before the woman migrates, childbearing occurs mainly in the year of migration or shortly after. Thus, fertility seems disrupted before the migration of the woman.

The third strategy—simultaneous union formation and migration—could be found only for female migrants (female Cluster 3, *Childless relationship*). Most of these women begin a partnership in the same year as migration, and are likely to participate in marriage migration. Migration and union formation seem strongly interrelated for these women. The trajectory depicted in Cluster 4 can also be interpreted as interrelation of events, namely of migration and the birth of the first child. Finally, for women an additional cluster was identified: single mothers. Marital instability in the context of international migration, especially for female migrants, is in line with previous findings for other migratory settings (Glick 2010), and it also appears to be the case for Senegalese women.

The multinomial logistic regression analysis revealed important associations between family formation, migration and other factors. Unsurprisingly, age at migration is an important predictor of the individual stage in the life course. However, destination countries also seem to attract migrants in different family situations. For instance, single childless men are more likely to migrate to France, whereas men who are in a union and have three children or more are less likely to choose France as a destination (compared to Italy).

The results complement current literature on migrant fertility in several ways. First, new insights on the fertility of migrants can be gained by focusing on the Senegalese case. Most previous studies concentrate on the case of Mexican migration to the US (Lindstrom and Giorguli-Saucedo 2002, 2007; Parrado 2011) or former guest workers in European destination countries (Cygan-Rehm 2011; Milewski 2007, 2010; Wolf 2016). These findings may also be valid for other migratory flows from Sub-Saharan Africa to Europe or other long-distance intercontinental migratory systems. Second, going beyond the event-centred approach by focusing on family formation trajectories that cover several events (union formation, fertility timing and quantum, migration) a more holistic picture of the migration-fertility link can be obtained. The results demonstrate the diversity of trajectories and highlight the differences across genders. Describing family life trajectories as sequences of states enables the joint examination of different dimensions of the life course. Third, from a theoretical perspective, the sequence analysis has shown how the two underlying hypotheses—disruption and interrelation of events—have different implications for men and women. These gender differences should be taken into account in future studies on migrant fertility.

The MAFE data contains valuable and unique information on family trajectories before and after migration. Several limitations, however, should be noted. Firstly, the analysis samples of male and female migrants

are not very large, as I had to drop several cases due to the data requirements for conducting sequence analysis. Especially the sample sizes for some of the clusters are rather small. Secondly, these small sample sizes are also the reason why separate sequence and cluster analyses by country of destination could not be carried out. Disentangling differences in family formation and migration trajectories according to the specific receiving context—with differential immigration policies, fertility levels and norms, and economic situations—could be an interesting avenue for future research. In an attempt to overcome this limitation, the regression models account for the specific destination country, but even better insights could be gained by showing, for example, that the clusters vary by receiving context. Despite these limitations, this study provides new evidence for the disruption and interrelation of events hypotheses for long-distance male and female migrants. Family trajectories in this context are complex and their diversity was reflected in the clusters presented in this work. There also appear to be important differences in trajectory according to migrant gender, suggesting that the standard hypotheses used to describe and explain the fertility of migrants should be adapted to men and women separately. Finally, in a context where female migration occurs mostly for family reasons—marriage migration or family reunification—and where childbearing takes place mainly within unions, taking a couples perspective could be a fruitful approach for future research in this field.

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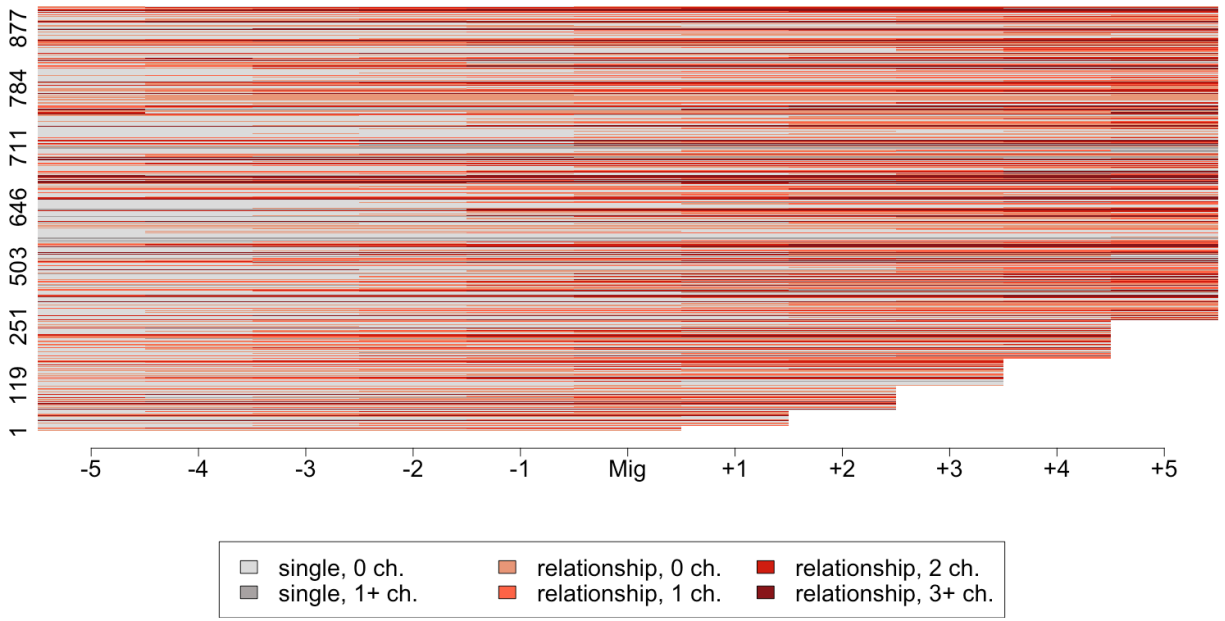
Appendix

Figure 5. Index plot entire sample, including incomplete sequences

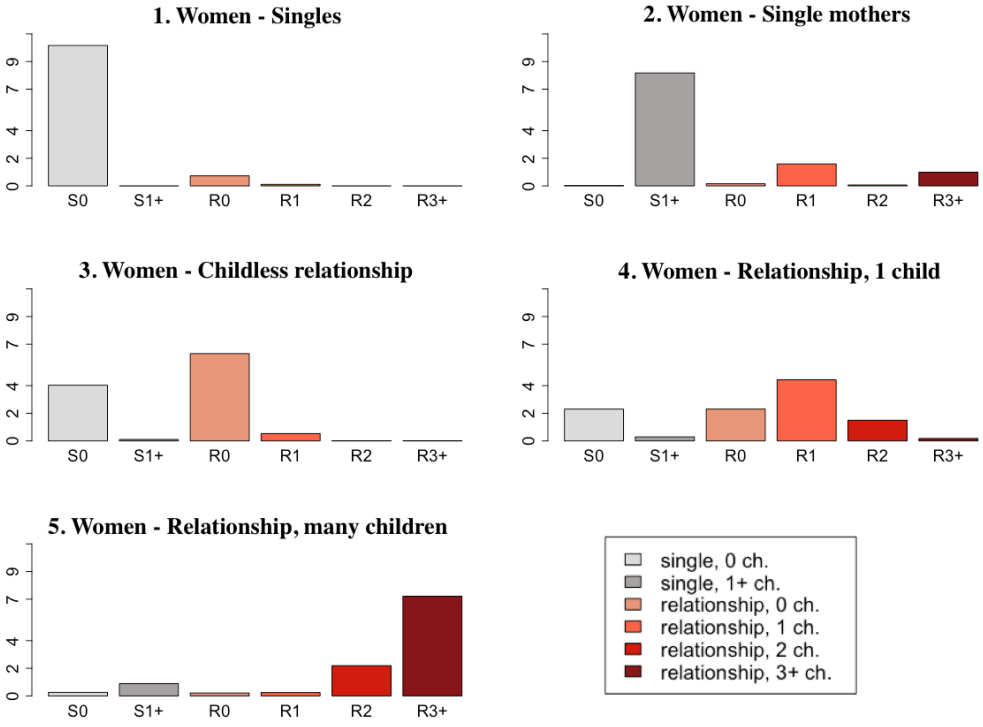


Data: MAFE-MESE Biographic Survey. Weighted

Figure 6. Mean time spent in each state for 5-cluster solution, male migrants

Data: MAFE-MESE Biographic Survey. Weighted.

Figure 7. Mean time spent in each state for 5-cluster solution, female migrants



Data: MAFE-MESE Biographic Survey. Weighted.

CHAPTER 3:

Fertility behaviour of migrants and non-migrants from a couples perspective: The case of Senegalese migration to Europe

Abstract

The aim of this chapter is to examine the relationship between migration and fertility in the context of Senegalese migration to Europe by taking a couples perspective. This perspective gives us a unique look at migrant selection processes by comparing Senegalese migrants to Europe with the Senegalese staying back home in Africa. The theoretical framework builds on some of the major hypotheses that have been developed to explain the effect of migration on fertility and vice versa: disruption, interrelation of events, adaptation and selection. For the empirical analysis I use data collected in the framework of the MAFE-Senegal (*Migrations between Africa and Europe*) project. This project collected longitudinal retrospective life-history data in origin and destination countries. Using couples as the unit of analysis (2,542 partnerships) I compute discrete-time hazard models and Poisson regressions to analyse the timing of the first birth as well as higher-order births and completed fertility. The results indicate that geographic separation of partners leads to disrupted fertility in the short-run, but completed fertility is also affected. Furthermore, couples with two migrant partners have a very fast transition to a first birth in the immediate time after reunification at destination. Fertility adaptation of migrant women towards lower fertility levels at destination was also observed. Finally, migrant selection on unobservable factors is most likely to be responsible for the remaining fertility differentials between migrant and non-migrant couples, which could not be explained by any of the observable characteristics.

3.1 Introduction

In 2013, about 540,400 Senegalese lived abroad, which corresponds to almost four per cent of the Senegalese population (World Bank 2016). This number does not include undocumented border crossings and internal migrations, and thus the actual share of emigrants might be even higher. In the same year, the top five destination countries of Senegalese migrants were France, the Gambia, Italy, Spain and Mauritania (World Bank 2016). With a total fertility rate of 5.1 children per woman (ANSD 2014), fertility is high and the country is still in the early stages of the demographic transition. Whereas research on international migration and fertility of Sub-Saharan African migrants to Europe is scarce, internal migration processes in this region have been more extensively studied (Agadjanian et al. 2011; Chattopadhyay et al. 2006). Other studies examine the fertility of African migrants in European destination areas, but do not take into consideration the fertility behaviour at origin (Bledsoe et al. 2007; Toulemon 2004).

The theoretical framework builds on the major hypotheses that have been developed to explain the effect of migration on fertility (Andersson 2004; Kulu 2005; Kulu and González-Ferrer 2014; Lindstrom and Giorguli-Saucedo 2002, 2007; Milewski 2007; Wilson 2015). The disruption hypothesis postulates that fertility is lower in the time immediately before and after migration. The interrelation of events hypothesis assumes that union-formation and childbearing are interrelated events. The adaptation hypothesis says that migrants' behaviour converges to that of the host society. The socialization hypothesis stresses the importance of the values and norms present during childhood for migrant fertility behaviour. And finally, the selection hypothesis states that migrants are a selected group from their country of origin with differential fertility behaviour. Migrants can be selected on observable characteristics, such as education, or unobservable characteristics, such as family preferences or social mobility aspirations. These hypotheses are partly competing, partly complementary and have the common goal of explaining the impact of geographic mobility (internal and international migration flows) on fertility timing and quantum of the migrant population (Kulu 2005). This article uses these hypotheses and adapts them to childbearing behaviour within couples by considering these research questions: *What are the differences in fertility timing and quantum between migrant and non-migrant couples? Are migrant couples a selected group with differential fertility patterns? Or, rather, are these differences the result of disruption, interrelation of events and adaptation processes?*

To answer these questions, longitudinal data on childbearing patterns of migrants and non-migrants at origin, as well as the migration moves of both partners, are required. The MAFE data (*Migrations between Africa and Europe*) fulfil these requirements. This project collected longitudinal retrospective life-history data in Senegal and in the major European destination countries: Spain, France and Italy. The dataset permits the studying of short-term effects of migration on fertility, as well as completed fertility. Using event history techniques and Poisson regressions, I analyse the transition to a birth, in general, and to first births, as well as completed fertility in order to compare the timing and quantum of childbearing of migrant couples, in which one or both partners migrated to Europe, and of non-migrants. High rates of outmigration and high fertility levels make Senegal an interesting case to study the fertility behaviour of migrants; the separation of couples due to international migration is likely to have a major impact on the timing of births and completed fertility. Furthermore, the two regions—Senegal and Western Europe—are considerably different in terms of fertility timing and levels, family and gender norms and values, as well as economic development.

This study aims at filling several gaps in current research. Firstly, taking the couple as the unit of analysis and accounting for both partners' migratory status at each point in time allows to examine the timing of births, regardless of choice of partners and potential separations. Secondly, the selection hypothesis—comparing migrants with non-migrants—has hardly been tested in previous studies, mainly due to limited data availability. As migrant selection effects, especially selectivity on unobservable characteristics, are difficult to measure, my approach is to account for short-term effects that migration may have on fertility timing (disruption and interrelation), adaptation processes towards lower completed fertility at destination, as well as selectivity on observable characteristics, in order to disentangle whether migrants are also selected on unobservables. Thirdly, research on intercontinental long-distance migration and fertility in this geographic context is scarce and it is not clear if migrants from Sub-Saharan Africa follow similar patterns with regard to family formation as migrants in other migratory settings. Most of the existing research has been done on short- and long-term effects of migration from high- to low-level fertility countries on fertility quantum and timing, mainly concentrating on Mexican migration processes to the US. Fourthly, most studies on migration and fertility concentrate on women only, neglecting entirely the location of the father. A few other studies include migrant men's migration trajectories and the impact on fertility (Guetto and Panichella 2013; Wolf 2016), though they do not take a couples perspective. However, male and female migration

and fertility trajectories tend to be "coordinated and interdependent" and part of a joint household strategy (Lindstrom and Giorguli-Saucedo 2007, p. 827). Therefore, I examine male and female migration trajectories jointly and their implications for the fertility timing and the number of children a couple has.

3.2 Background

3.2.1 Partnerships and fertility in Senegal

It is crucial to take into consideration the particular partnership and childbearing arrangements and norms, which diverge considerably from Western habits, in order to understand the behaviours of Senegalese couples and their migration dynamics. In Senegal, the extended family is the basic social unit (Baizán et al. 2014). On average, a household consists of eight individuals (ANSD 2014), one of the largest household sizes in West Africa. This size can be seen as a result of the extended family structure forming the household and the polygamous regime. Marriage in Senegal is almost universal and staying unmarried is seen as a "secondary choice" (Antoine and Nanitelamio 1996, p. 130) and few Senegalese do not marry. The legal minimum age for marriage is fixed at 20 years for males and 16 years for females, but women often get married at even younger ages (Bass and Sow 2006). In 2013, the mean marital age was 22.4 (rural: 19.4, urban: 25.5) for women and 29.9 (rural: 27.7, urban: 31.9) for men, indicating an important age difference between spouses (ANSD 2014). Furthermore, 23.1 per cent of married men live in polygamous marriages, and 44.0 per cent of all married women have at least one co-wife (ANSD 2014). Divorce rates are relatively high, especially in urban areas (Antoine and Nanitelamio 1996), but due to rapid remarriage and high levels of polygamy among the men, only 0.7 and 2.1 per cent of the men and women, respectively, were divorced in 2013 (ANSD 2014).

Generally, marriages are arranged within the extended family and are often formed between cousins (Vives and Vazquez Silva 2016). Among migrant families, arranged marriages are also frequent (Beauchemin et al. 2013). After marriage the wife usually moves in with her family-in-law to care for the elders, especially her mother-in-law (González-Ferrer et al. 2012). This does not necessarily mean, however, that she lives under the same roof as her husband, as it is not unusual for Senegalese couples to live in different places (Beauchemin et al. 2013). Separate residence, arranged marriages, polygamy and relatively big age differences between

spouses are all factors that add to a certain social distance between partners (González-Ferrer et al. 2012; Vives and Vazquez Silva 2016). Fertility in Senegal is still high with 5.1 children per woman in 2013, with an important urban-rural divide (rural: 6.2, urban: 4.1; ANSD 2014). The high fertility levels can be seen as the result of "the cultural desire for large families, the high infant mortality rate, and the low use of modern contraceptive methods" (Bass and Sow 2006, p. 95).

3.2.2 Migration to Europe: History and family strategies

Senegalese migration to France, as the former colonial power, began in the early 1960s (Beauchemin et al. 2013). In the beginning, Senegalese were recruited to join the French army, and later, many of them stayed to work in the automobile industry. In the 1970s and 1980s, economic migration to France became more difficult due to stricter immigration policies, and, consequently, migratory flows diversified and migrants also chose other European destinations. In the 1990s, Italy became the most important destination within Europe. From the end of the 1990s onwards, Spain also became an important receiving country for Senegalese migrants (Beauchemin et al. 2014). Independent migration of Senegalese women is an emerging, but still rather scarce, phenomenon (Toma and Vause 2013).

Family strategies of Sub-Saharan African migrants in Europe changed over time. In the sixties, when the Senegalese migratory flows to France increased, mainly young male single migrants moved over to France (Barou 2001). After spending some ten years at destination and accumulating sufficient economic resources, these men returned for the first time to their origin country in order to get married there and to procreate the first child. The migrants went back to Europe, but they returned to their origin country at more or less regular intervals. During the visits at home, the men might marry other wives and produce more children. When the migrants returned definitively to their origin country, they were in the advantaged position of being the head of a family with various polygyny unions and many offspring (Barou 2001). These circular migration strategies of male migrants became more difficult when immigration policies became more restrictive. The possibility of reunifying with partners (and children) at destination appeared as a new option in the late 1970s (Beauchemin et al. 2013).

The migrants who, from the 1990s onwards, chose Italy and Spain as preferred European destinations faced similar problems with regard to their family arrangements. However, they differ from the former migrants to France in that they originate more often from rather urban areas in

Senegal, while the migrants to France had more rural backgrounds. Furthermore, they belong more often to the Mouride brotherhood, a Muslim religious group with a strong attachment to their home country and their families and who pursue the goal of "creating an economic, social and spiritual life for themselves and their families in Senegal" (Riccio 2001, p. 584). Hence, migrants maintain a strong link with their communities of origin.

In all three destination countries, reunification at destination was seen as a "sub-optimal choice" (Baizán et al. 2014) for several reasons. Firstly, the elders often opposed the practice of reunification at destination, since they would lose the remittances sent by their sons from Europe, as well as the help in the household of their daughters-in-law (Baizán et al. 2014; González-Ferrer et al. 2012). Secondly, large and often polygamous Senegalese families encountered problems in Europe, mostly related to difficulties in social integration and housing. As a result, restrictive immigration policies prohibited the reunification of polygamous families (Baizán et al. 2014; Beauchemin et al. 2013). Other studies using the MAFE data found that partners living in polygamous unions have significantly lower odds of reunifying at destination (Baizán et al. 2014; Beauchemin et al. 2015). Thirdly, the social distance and the normality of spatial separation among couples contributed to long-lasting transnational family arrangements (Vives and Vazquez Silva 2016). In fact, transnational partnerships are frequent and more prevalent than reunification at destination (Baizán et al. 2014).

A peculiarity of Senegalese couples in the context of international migration is that a relatively high share of unions are formed at a distance, meaning that the partners do not reside in the same country at the moment of union formation. Consequently, there is no time for a dating period before union formation, since marriages are sealed rapidly during the migrant's visit in Senegal and are negotiated between the two families or within the extended family (Mondain et al. 2009). According to Baizán et al. (2014) one half of all transnational Senegalese couples initiated their union while the man already lived in Europe. Union formation at a distance is the result of a strong negative sex ratio of the Senegalese population in European destination countries, especially the lack of single migrant women since independent female migration is rare (Baizán et al. 2014). However, the same study shows that union formation at a distance does not affect the pace of (re)unification, neither at origin nor at destination, compared to partners who had previously cohabited (Baizán et al. 2014).

3.3 Migration and fertility: Theoretical framework, previous empirical evidence and hypotheses

Most studies on migration and fertility build on several hypotheses that describe and explain differences in fertility timing and quantum between migrants and those who stay in their origin countries, namely disruption, interrelation of events, adaptation, and selection.[1] Other studies use these theories to explain differences in migrant fertility behaviour and the population living at destination (Kulu 2005; Milewski 2007). While the selection hypothesis refers to the fact that migrants are a selected group with characteristics that are associated with differential fertility behaviour compared to the overall origin population, the other hypotheses describe diverging fertility patterns linked to the migration process itself. The joint analysis of these hypotheses explaining migration and fertility is fundamental, since in most cases they are not mutually exclusive but rather complementary. Moreover, they may apply at the same time or sequentially, one after the other. Although the main focus of this study is on the selection hypothesis, the other hypotheses have to be addressed and accounted for in order to disentangle whether migrants are indeed a selected group with differential fertility behaviour, or whether these differences are rather the result of the migration process itself.

In this section I discuss how the four hypotheses may apply to Senegalese migrant couples in Europe and what the expected differences to non-migrant couples are. The focus is therefore on both male and female migration moves and the implications for couples' fertility outcomes. By taking this approach, I intend to examine whether migrants in general, and, more specifically, couples formed of at least one migrant, are selected in terms of their fertility behaviour.

[1] Another hypothesis is the socialization hypothesis that states that the first generation of migrants maintains the fertility patterns of their origin country and only subsequent generations, born and socialized in the host country, converge to the patterns of their native-born counterparts (Milewski 2007). Since I am interested in childbearing patterns of first generation migrants themselves, the socialization argument is not relevant here and will not be addressed further.

3.3.1 Migration and fertility timing: Disruption and interrelation of events

Male and female migration may affect the timing of childbearing within partnerships by accelerating or postponing the transition to a first or higher-order birth compared to the birth timing of couples formed by two non-migrants. Hence, the migration process itself may have an effect on fertility-timing outcomes, leading to shortened or prolonged birth intervals due to migration of one or both partners. Disruption and interrelation of events are the two mechanisms that explain the immediate effect that migration may have on the fertility timing of migrants. The *disruption hypothesis* affirms that birth timing and birth spacing of migrants may be disrupted during the time shortly before and after migration due to "disruptive factors" inherent to the migration process—such as economic and psychological stress or the geographic separation of spouses (Kulu 2005). It has also been observed that disrupted fertility behaviour before the migration move was recovered by higher childbearing rates shortly after migration, known as "catching-up behaviour" (Goldstein and Goldstein 1981; Milewski 2007). In this vein, the *interrelation of events* hypothesis argues that higher birth risks immediately after migration are not a catching-up of fertility, but rather can be seen as the coincidence of several events—migration and union formation—taking place at the same time and thereby resulting in higher birth risks (Andersson 2004; Milewski 2007; Mulder and Wagner 1993; Stark 1988). This has been observed for marriage migrants who enter the destination country as 'imported brides' (as they are mostly female) and who tend to have a fast transition to a first child soon after migrating and reunifying with their spouse at destination (Milewski 2007).

The geographic separation of partners due to migration is likely to have a disruptive effect on couples' fertility calendar due to reduced exposure to conception, especially in origin countries like Senegal with high fertility rates. In fact, it has been mathematically proven that geographic separations of spouses lead to reduced annual birth probabilities (Menken 1979) and, as a consequence, longer birth intervals compared to non-separated couples. This short-term disruptive effect of couple separations on birth probabilities has been found for Mexican migrants to the US (Lindstrom and Giorguli-Saucedo 2002, 2007; Massey and Mullan 1984), as well as in the context of Sub-Saharan African migration, e.g. intercontinental and internal migration in Mozambique (Agadjanian et al. 2011) or internal migration in Ghana (Chattopadhyay et al. 2006). Moreover, Ghanaian migrants to Europe experience lower first birth risks than non-migrants (Wolf and Mulder 2017). Disrupted fertility due to couple separation may occur independent of parity, and several births of

the same couple may be affected. However, previous studies found that second and higher-order births are more affected than first births (Chattopadhyay et al. 2006).

A strong disruptive effect of couple separation on fertility is expected for Senegalese couples in which one partner migrated to Europe. As explained above, long-lasting transnational family arrangements are often the preferred option of Senegalese couples due to strict visa requirements and restrictive immigration policies as well as cultural preferences. Furthermore, long geographic distances associated with high travel expenses (González-Ferrer et al. 2014) make circular migration strategies more difficult compared to, for instance, Mexican migrant couples. For these reasons, Senegalese couples experience prolonged separations from each other. Therefore, my expectation with regard to fertility disruption is:

H1a: Disruption & fertility timing

Geographic separation of couples related to the outmigration of one partner, especially in the case of long distance international migration, is expected to disrupt childbearing and, accordingly, couples that experienced separation of this kind will have lower birth probabilities compared to non-migrant couples.

Fertility disruption due to separation of partners primarily influences birth timing; however, in the long run, completed fertility may also be affected, if couples are not able to recover the lost fertility. Basically, it depends on the number of children that a couple would have had without separations and the potential of couples to make up for lost reproductive time. If migration trips are short or if they coincide with non-fecund periods (Lindstrom and Giorguli-Saucedo 2002), couples are likely to catch up with their non-migrant counterparts in terms of number of children. Upon return of the migrant partner, increased coital frequency can raise the likelihood of conception and couples can compensate for the reproductive time they lost due to separation (Agadjanian et al. 2011; Lindstrom and Giorguli-Saucedo 2002). Furthermore, migrant couples can prolong childbearing to older ages when non-migrant couples generally already stopped having children (Lindstrom and Giorguli-Saucedo 2002). For these reasons, in Mexico, although birth probabilities are reduced as a result of couple separation in the short run, migrant couples do not have lower levels of completed fertility in the long run compared to non-migrant couples, since most separations are relatively short and do not happen year after year (Lindstrom and Giorguli-Saucedo 2002). Chattopadhyay et al. (2006) similarly found a disruptive effect of internal

migration in Ghana on higher-order births (not first birth), but no impact on the total number of children.

In Senegal, however, migration-related separations are more long-term arrangements and thus fertility recovery might be more difficult. Baizán et al. (2014) found that ten years after migration-related separation, only approximately 40 per cent of the migrants had (re)unified either at destination or at origin. Hence, the conception of more children is restricted to visits of the migrant partner at origin or the non-migrant partner at destination. I hypothesize the following:

H1b: Disruption & fertility level
Controlling for mutual visits, the longer partners are separated, the lower their completed fertility will be.

Generally, the hypothesis of fertility disruption is based on the assumption that unions are formed with both partners still living at origin, i.e. partners were already in a relationship before the out-migration of any of the partners. For example, all partnerships analysed by Lindstrom and Giorguli-Saucedo (2002, 2007) start with both partners being in Mexico. However, as explained above, Senegalese marriages are frequently formed at a distance. Union formation at a distance does not necessarily imply marriage migration, since reunification at destination is not the ultimate goal for all Senegalese couples (Baizán et al. 2014). The woman may stay in Senegal and the man in Europe, and transnational family arrangements might continue in the same way as for partnerships that were formed before the outmigration of one of the partners. Hence, the fertility timing of couples that initiated their relationship at a distance should not be substantially different from couples that were formed before the man migrated. In this case, the separation of couples should also lead to disrupted fertility timing and lower birth rates compared to non-migrant couples. However, partners that decide to marry across borders might be selected into this kind of union formation and as a consequence fertility behaviour may also differ.

For cases in which the woman decides to reunify in Europe with her husband and to settle there, it is likely that the fertility timing of these couples will be different from non-migrant couples. The importation of co-ethnics from the country of origin has been analysed intensively for Turkish migrants in Germany (González-Ferrer 2006; Milewski 2007; Wolf 2016) and Turks and Moroccans in Belgium (Lievens 1999). The fertility behaviour of this type of partnerships has also been addressed. Most studies agree on the fact that marriage and migration are interrelated events and that, after marriage migration, couples have an accelerated transition to a first child (Andersson 2004; Milewski 2007; Nedoluzhko

and Agadjanian 2010; Nedoluzhko and Andersson 2007), which may be interpreted as an act to "complete" the union formation of a couple and strengthen the position of the immigrated woman (Milewski 2007).[2] Marriage migration, however, does not affect the timing of second- and higher-order births (Lindstrom and Giorguli-Saucedo 2007). Furthermore, marriage migrants have faster first birth transitions compared to the transitions among 'normal' family reunifiers, whose union has not been formed at a distance (Wolf 2016). Of course, in addition to the interrelation of events, differential age structures of both types of couples and possible previous parities of the couples that were not formed at a distance may also contribute to these differences. My hypothesis is:

H2: Interrelation of events & fertility timing
Couples who participate in marriage migration will make a faster transition to a first birth after union formation in the years immediately after reunification at destination compared to non-migrant couples.

3.3.2 Migration and adaptation of fertility

The *adaptation hypothesis*[3] states that if initial characteristics in fertility timing and quantum are different in origin and destination countries, migrant behaviours tend to converge to the norms of the host society with increasing duration of stay at destination (Andersson 2004). Over time, migrant fertility differs more and more from the patterns prevalent at origin. This convergence does not necessarily imply a "process of acculturation, but can merely be seen as an adaptation to the general

[2] In other migratory settings it has been found that the fast transition to a (first) birth shortly after arrival can be seen as a legal strategy to get the citizenship of the destination country (e.g. US) for that child in order to regularize the legal status of the parents themselves (Lindstrom & Giorguli-Saucedo, 2007). This so-called legitimacy hypothesis (Milewski 2007) depends on the legal conditions of the respective destination countries. However, for the case at hand, Senegalese children born in Spain, France or Italy do not get the corresponding citizenship by birth. However, other advantages may emerge, such as social security and health care benefits, as well as the children's right for education (Bledsoe et al. 2007; Bledsoe and Sow 2008).

[3] Other authors distinguish between adaptation and assimilation, e.g. Lindstrom and Giorguli-Saucedo (2002, p. 1346): "Whereas the assimilation hypothesis refers to the adoption of destination fertility norms and values, the adaptation hypothesis refers to an adjustment in fertility behaviour that occurs in response to the economic opportunities and constraints present in a destination." But following Andersson (2004, pp. 752–753): "we prefer to label such a possible medium-term convergence of fertility levels as a process of adaptation, rather than one of assimilation."

situation in the new country" (Andersson 2004, p. 752), with different political and societal systems, a different labour market, different gender roles (Andersson 2004), as well as higher costs of having children (Lindstrom and Giorguli-Saucedo 2007). These costs may be divided into direct family maintenance costs as well as opportunity costs associated with having children (Becker 1991), which are both higher in most Western countries compared to most migrant origin countries.

The distinction between selection and adaptation effects is challenging. Adaptation is based on the assumption that migrants are not a selected group from their country of origin, but the fertility behaviour of both groups diverges by migrants' duration of stay at destination. However, both approaches are not necessarily mutually exclusive and can apply at the same time. Furthermore, if migrants are a highly selective group, they may already be quite similar to the population at destination, and thus selection may even preclude adaptation (Chattopadhyay et al. 2006).

Convergence towards the fertility patterns of the destination country implies that both partners are together in Europe and that migration is a rather long-term endeavour (Lindstrom and Giorguli-Saucedo 2007). Since temporary migrants are less exposed to norms and values at destination and they intend to return, the adaptation process is less intense (Lindstrom and Giorguli-Saucedo 2002). Adopting the norms of the destination society is gradual and should increase by duration of stay at destination. In the context of Mexican migration to the US, female partners are the ones who are more likely to adapt to the low fertility norms and economic circumstances present at destination, and thus "change their attitudes and ideas about childbearing and family size" (Lindstrom and Giorguli-Saucedo 2002, p. 1357). Migrant women at destination are also more likely to use modern contraceptive methods (Vives and Vazquez Silva 2016). In contrast, men's solo migration has not been found to negatively influence the couple's fertility due to adaptation processes (Lindstrom and Giorguli-Saucedo 2002). Hence, the woman's duration at destination seems more important than that of the man in shaping fertility outcomes. The adaptation towards the new conditions at destination may occur from shortly after the migration move onwards (Lindstrom and Giorguli-Saucedo 2002). My hypothesis regarding adaptation is the following:

H3: Adaptation & completed fertility
Since costs of childbearing and childrearing are higher and fertility levels are lower in European destinations than in Senegal, Senegalese migrants in Europe are expected to have fewer children than non-migrant couples, especially the longer the woman stays at destination.

3.3.3 Selection

The *selection hypothesis* argues that the fertility behaviour (timing and quantum) of migrants differs from that of non-migrants due to the fact that migrants are not randomly selected from their population of origin. Migrants may be selected in terms of observable characteristics, such as education and other socioeconomic factors, as well as on unobservable characteristics (Lindstrom and Giorguli-Saucedo 2002). The selection hypothesis has been analysed only in a few cases, since bi-national surveys sampling migrants and non-migrants at origin have rarely been conducted. Most previous studies on international migration and the fertility selection hypothesis have been done with Mexican migrants in the US, for which this kind of data are available. Although the selectivity of Mexican migrants in the US and their fertility outcomes has been studied extensively, researchers arrived at different conclusions. Frank and Heuveline (2005) found changing differentials between fertility rates of Mexican immigrant women in the US and the rates of Mexican non-migrants over time: while fertility was lower among migrant women compared to the non-migrants in earlier periods, fertility rates are higher for more recent periods. On the one hand, this can be explained with a strong fertility catch-up effect in the period shortly after migration, thus a timing effect. On the other hand, "[m]igration increasingly may be selecting women with sociodemographic profiles that are conducive to higher fertility patterns, such as women with a lower educational level from more rural and/or marginalized areas that are characterized by higher fertility norms" (Frank and Heuveline 2005, p. 97), thus a selection effect. However, Parrado (2011) questions these findings by stating that the high fertility levels of Mexican women in the US are mainly the result of estimation problems, since period estimates used in most previous studies lead to biased results. Using completed fertility instead lowers the results drastically. Choi (2014) contributes to this discussion in her recent paper by examining fertility changes within and across generations by taking into account pre-migration fertility of migrants. She pools different surveys from the US and Mexico in order to obtain complete birth histories of non-migrants in Mexico as well as Whites, US-born Mexican Americans and Mexican migrants in the US. She finds that Mexican migrants to the US are a positively selected group in terms of fertility, which she attributes to the fact that many Mexican migrants come from rural areas in Mexico. But she finds very little support for negative educational selection of Mexican migrants. In short, authors agree on the fact that Mexican migrants are selected on observable and unobservable characteristics that influence their fertility behaviour, but the degree and the type of selection are not clear. Nevertheless, these former studies may serve as a valid basis to examine the selectivity of Senegalese migrants in Europe.

In the following sections, selection processes on observable and unobservable characteristics are described and adapted to the Senegalese case. Another form of selectivity, however, will not be discussed and addressed in this study: namely the (self-)selection into partnership. Fertility differences between migrants and non-migrants may operate through differential selection into partnerships, as has been found for Senegal (Marchetta and Sahn 2015). Variations in the fertility timing of both groups may especially be the result of different ages at first union formation. However, the aim of this study is the analysis of fertility patterns within partnerships, and therefore possible selection processes regarding union formation will not be considered here.[4]

Selectivity on observable characteristics

Intercontinental migration from Sub-Saharan Africa to Europe involves overcoming long geographic distances, implying a relatively high amount of financial resources and knowledge (González-Ferrer et al. 2014). Thus, the poorest ones are not those who manage migrating from Senegal to Europe, but rather those with a certain educational and financial level (Shaw 2007; van Dalen et al. 2005). Moreover, "threshold effects" (Shaw 2007) hinder the ability of the poorest Senegalese and those with less education to undertake any international migration at all. The positive educational selection of Senegalese migrants, however, is not as strong as it is the case for other countries in the region, e.g. Ghana. This might be attributed partly to the overall low educational and literacy levels of the Senegalese population, which might make it more difficult to distinguish any effect (Shaw 2007; van Dalen et al. 2005). However, a recent study that uses the same dataset as this paper has shown that Senegalese migrants in Europe are a positively selected group of their population of origin in terms of socioeconomic status (González-Ferrer et al. 2014). Senegalese with secondary and tertiary education are significantly more likely to migrate to Europe, compared to those with only primary or less education. Moreover, individuals belonging to households with assets (properties) are more likely to migrate to Europe than those without. While this study does not distinguish between genders, Toma and Vause (2013), using the same dataset, find that migrant women are more highly-educated than their non-migrant counterparts; this positive selectivity holds true for both independent female migrants as well as partner-related migration. Furthermore, in patriarchal societies like the Senegalese, where

[4] For demonstrative reasons I calculated the mean ages at first union formation for non-migrant and migrant men and women by educational level (only for respondents, not their partners). The results show no significant differences between migrants and non-migrants at the 1 per cent significance level.

women face social control by their extended family, highly-educated women are more likely to reunify with their partners in European destination countries, while less-educated women more often stay behind in the country of origin (Baizán et al. 2014; Beauchemin et al. 2015). Highly-educated men, respectively, are more likely to reunify in Europe than in Senegal (Baizán et al. 2014). Hence, both partners of couples who live together in Europe tend to be more highly educated than couples that are separated due to migration, or non-migrant couples.

This educational selectivity might explain—at least partly—differential fertility behaviour of migrant couples compared to non-migrant couples. Educational differences are one of the "best-established and most-widely studied socioeconomic differentials" (Bongaarts 2003). In most developing countries, poorer, less-educated and rural women have higher and earlier fertility patterns than their wealthier, more educated and urban counterparts (Bongaarts 2003). Women who have more than primary education have significantly less children in all developing countries (Bongaarts 2003). Education affects fertility through better knowledge of contraceptive use, increased bargaining power of women on fertility-related issues and a reduced risk of child mortality (Marchetta and Sahn 2015), among other factors. This relationship has been proven in several wide-range comparative studies in all developing countries, with a varying size of the effect in different regions and countries (Bongaarts 2003; Castro-Martín and Juarez 1995; Schoumaker 2004; Weinberger 1987). A recent study finds for Senegalese women a strong delaying effect of education on the age at first child, operating mainly through a later entry into marriage (Marchetta and Sahn 2015). Within partnerships, the effect of the education of the wife is more influential for couples' fertility behaviour than the influence of the husband's educational level (Jejeebhoy 1995). Hence, the timing of births and the total number of children a couple has depends strongly on women's educational level. This leads us to the next hypothesis:

H4a: Selection on observables & fertility timing and level
As migrants to Europe tend to be positively selected in terms of education, couples including at least one migrant partner are expected to have a postponed fertility calendar and a lower number of children compared to non-migrant couples.

Selectivity on unobservable characteristics

Educational selectivity alone does not explain the entire difference between migrants' and non-migrants' fertility outcomes. It has been found that other unobserved ('unmeasured') characteristics of migrant couples

influence their fertility behaviour and make them different from non-migrant couples. Authors argue that migrants have intrinsic and hardly measurable preferences or personality traits that shape their fertility outcomes, such as social-mobility aspirations (Milewski 2007), openness to innovation (Lindstrom and Giorguli-Saucedo 2002), and high aspirations for children and family proneness (Lindstrom and Giorguli-Saucedo 2007; Milewski 2007). Other authors even reverse the direction of causality by arguing that fertility preferences shape migration decisions (Ribe and Schultz 1980). Ribe and Schultz (1980) were the first to bring up this argument, employing it in their study on childbearing and internal (rural-urban) migration in Colombia. Their underlying argument is that "migrants are systematically drawn toward locations where the costs of having their preferred family size are relatively low, other things being equal" (Ribe and Schultz 1980, pp. 45–46). In other words, migrants are supposed to move to areas where living conditions are suitable for their personal preferences towards family formation (e.g. locations with low costs for having the preferred family size). Other researchers, while not going as far as reversing the direction of causality, also found evidence for migrant couples being a selected group with regard to their fertility preferences (Lindstrom and Giorguli-Saucedo 2002). In the Sub-Saharan African context, Chattopadhyay et al. (2006) find that Ghanaian internal migrants' timing of births as well as their total number of children already resembles the patterns of the region where they move to before migration, pointing to a migrant selection effect. This kind of migration—driven by fertility preferences—is most likely to occur at the onset of the reproductive period and the beginning of family formation.

Using data from the Mexican Migration Project, Lindstrom and Giorguli-Saucedo (2002, 2007) distinguish between couples with temporary and those with more permanent migration strategies, both having a different impact on childbearing outcomes. On the one hand, couples with high fertility preferences take advantage of the higher wages in the US and lower family maintenance costs in Mexico by pursuing a transnational migration strategy with repeated short-term/circular trips to the US. These men hold more traditional and conservative family values and preferences and, in this context, male migration has no depressing effect on couples' subsequent fertility suggesting a rejection of the low fertility norms experienced during their US stay. On the other hand, Mexican couples who prefer smaller families are the ones who settle more permanently in the US. These two migration strategies provide important insights into how migrants are selected according to their fertility preferences and how couples manage to implement these preferences across borders.

For the case of Senegalese in Europe, long distance, restrictive migration policies and high costs of migration between origin and destination

complicate circular and repeated migration strategies. However, similar to Mexican migrant couples, Senegalese couples with preferences for a larger family size, might arrange their migration endeavour as temporary and without the intention to settle permanently in Europe, where the costs of childrearing are much higher than in Senegal. To ensure the economic feasibility of having many children, the husband might migrate alone to Europe to increase family income, while his wife and children stay at origin, where childrearing is cheaper and they can build on the support of their (extended) family. Hence, family life is transnational and couples' time together is restricted to more or less periodic visits of the man at origin or the woman at destination. Reunification of these couples is likely to take place at origin (Baizán et al. 2014), where the couples might accelerate reproduction to make up for the time they were separated. On the contrary, Senegalese couples that prefer only a small number of children are likely to envisage a permanent migration strategy and tend to reunify with their wives at destination. I hypothesize the following:

H4b: Selection on unobservables & fertility level
Net of educational selectivity and separation, migrants intending a permanent settlement in Europe are expected to be selected on lower-than-average fertility compared to migrants who intend to return and non-migrant couples.

3.4 Data, measures and analytical approach

3.4.1 Data: The MAFE-Senegal Survey

The aim of this study is to investigate the differences between non-migrant and migrant couples with regard to their fertility behaviour. In this empirical section I disentangle whether both groups differ in their fertility behaviour as a result of the migration process itself (disruption, interrelation of events, adaptation), or whether migrant couples are a selected group with differential fertility behaviour independent of the migration process (selection). The data requirements to properly analyse this are various. Firstly, I need a dataset that includes information on migrants as well as on non-migrants. Therefore, a transnational sample is required that covers data both on individuals that migrated, as well as individuals that never left the country of origin. Secondly, since I focus on couples, a database is needed that holds information on the individual level as well as on the couple level. Thirdly, I am interested in the timing of fertility and the temporal ordering of migration and childbearing events. Hence, a longitudinal time-varying dataset is needed.

The MAFE survey (*Migrations between Africa and Europe*) is one of the few dataset that fulfils these criteria. In the framework of the MAFE project, longitudinal life history data was collected in Sub-Saharan African origin countries and in European destination countries. For the Senegalese part of the project, about 200 current Senegalese migrants were interviewed in each European destination country—Spain, France and Italy—throughout 2008. Furthermore, some 1,000 individuals (non-migrants, returnees and migrants' spouses) were interviewed in Senegal. In Spain, a second round of the survey was conducted in 2011. This second round of interviews, called MESE (*Migraciones entre Senegal y España*), adds 405 individuals to the original sample of Senegalese migrants in Spain.[5] In total, the dataset contains life histories of 2,073 men and women.

In each country, a different sampling strategy was applied to select the respondents. In Spain, the municipal population register (*Padrón*) served as a national sampling frame and allowed to draw a random sample of undocumented and documented Senegalese migrants. Since in France and Italy no such sampling frame exists, a non-probabilistic quota sampling technique was used. The samples were stratified by age and gender; men and women each represented 50 per cent of all surveyed individuals in each country and half of the individuals of both genders were aged between 25 and 40, and the other half between 40 and 75 (Beauchemin and González-Ferrer 2011). In Senegal, a stratified random sample was drawn from households and individuals living in the region of the capital city Dakar. The fact that non-migrants were sampled only in Dakar might bias the results, insofar as the migrants interviewed in Europe originate from all over Senegal. The capital region is different from more rural Senegalese areas in socioeconomic and demographic terms, as well as in its gender norms, resulting in differential fertility behaviour in both regions (TFR in urban areas 4.1 and in rural areas 6.2 children per woman; ANSD 2014). Since fertility is lower in Dakar than in other areas, this inconsistency should not be problematic for the analyses, but rather strengthen the findings. Furthermore, all descriptive results are weighted to account for the different sampling procedures employed across different countries (for a detailed description of the weighting strategies see Schoumaker and Mezger 2013).

The dataset includes, apart from a variety of other topics, time varying residential and migration histories as well as information on childbearing

[5] In additional analyses I tested whether the results for Senegalese migrants in Spain were the same across the two rounds of data collection in this country. Although some minor differences appeared, the results were substantially the same and there should be no problem pooling the data of both rounds.

and union formation of the interviewee. Moreover, the respondent also provided some information on his/her past and current partners (educational attainment, socioeconomic and civil status at time of the survey, country of birth, nationality, and migration movements) and thus complete couple-histories could be reconstructed including exact information on the children born and the migratory movements of both. However, the survey did not ask for the partner's age or year of birth. Therefore, the multivariate analyses do not control for age and birth cohort of the partners. This is a major drawback for the analysis, since age is crucial for the study of fertility. As a robustness check, the same models were estimated separately for male and female respondents including the measure for age of the respondent. The differences in coefficients were rather small, since, apparently, time since union formation is more important for childbearing than the actual age of the partners (see Tables 4 and 5 in the Appendix).

Another issue to consider is a potential bias in the self-reported retrospective fertility histories of the respondents. Especially men (Rendall et al. 1999) and older individuals have been found to underreport their fertility (Murphy 2009). However, I do not expect these inaccuracies to be different for migrants and non-migrants and they should not impact the results.

3.4.2 Analytical approach

The empirical section is divided into two parts. The first part is on the timing of childbearing by focusing on annual birth risks and how migration contributes to short-term fertility differentials between migrant and non-migrant couples corresponding to my H1a, H2 and H4a. The second part analyses completed fertility and the long-term differences between these two groups referring to H1b, H3, H4a and H4b. Both parts use the couple as the unit of analysis, which is rather unusual for analysing fertility behaviour, and the more so when examining fertility in the context of migration (for an exeption see Lindstrom and Giorguli-Saucedo 2002). However, the advantages of such an approach are various. Firstly, from a descriptive point of view, this approach focuses primarily on the fertility behaviour per se by treating marriage as exogenous and ignoring partner choice, separations/divorces as well as other processes inherent to the development of partnerships that interfere with fertility decisions (Klein 2003). Secondly, from an analytical point of view, the characteristics of both partners can be taken into consideration (Klein 2003), which is especially important for my analysis, since I am interested in how both partners' migration history affects fertility outcomes. Especially in societies where marriage is almost universal and

childbearing occurs mostly within unions, as in Senegal, it makes sense to analyse migration and fertility decisions jointly by taking a couples perspective. Thirdly, since the aim of this paper is to compare the fertility behaviour of migrants and non-migrants, the couples perspective provides a common starting point—the onset of a partnership—for both groups that makes comparisons more straightforward.

Analysis of fertility timing

The sample size of the MAFE-Senegal survey is 2,073, however, for the purpose of this study a sub-sample was constructed. As my focus is on couples, respondents who indicated that they did not have any partnership (yet) were dropped from the sample (N=288). Furthermore, I only consider unions that were formed at age 55 (men) or 45 (women) or before, since international migrations as well as fertility happen mainly before these ages. For the same reasons, all the remaining partnerships are censored at the same age limits. I opted for different age thresholds for men and women, since men are able to have children up to higher ages and age differences between partners are relatively high in Senegal (ANSD 2014; Antoine and Nanitelamio 1996; Marchetta and Sahn 2015). The final sample comprises 1,785 respondents in 2,542 relationships. Hence, respondents' first unions as well as higher-order unions are included. Polygamous partnerships are considered and treated as separate unions; in the regression models I control for that. The partnerships in my sample include marriages and consensual unions, but most couples are married (almost 90 per cent of all couple-years are within marriage).

The data were arranged as a couple-year dataset, in which all partnerships of the respondent appear. The annual couple histories begin with the year of union formation (the youngest woman is 12 years old at the onset of her first partnership) and end with separation/divorce/death of one of the partners, age 55 (men) or 45 (women) of the respondent, or the year of the survey. The final dataset consists of 31,123 couple-years (10,510 couple-years for first birth analyses), each one corresponding to a year in a couple's history. Annual birth histories of couples are used to assess the impact of couple's migration status on the timing of births. The MAFE survey provides information on a year-to-year basis about births and the current whereabouts of both partners. I employ discrete-time hazard models with repeated events to predict the instantaneous hazard that an event (birth) will occur during a couple-year to test Hypothesis 1a (Model 1, Table 2). This means that, unlike other event history analyses, observations are not censored after the event has occurred in order to capture the effect of repeated events (Box-Steffensmeier and Zorn 2002). For the analysis of first birth risks (H2) couples leave the risk set once the

event (first birth) has occurred (Model 2, Table 2). Couples are at risk of having a first child starting in the year of union formation. From then on the dependent variable is coded 0 when no birth occurs during a couple-year, and it is coded 1 if a child is born. In short, the hazard of a birth in year *t* of couple *i* is expressed by:

$$\ln\left(\frac{P_{it}}{1-P_{it}}\right) = b_0 + \sum b_i X_i + \sum b_j X_{jt} + e_{it}$$

The model includes constant (X_i) and time-varying (X_{jt}) covariates[6] on the partnership and individual levels of both partners. Since the same respondent may have several partnerships, and thus he/she enters the sample more than once, the standard errors are clustered on the individual level. The main independent variable in the analysis of fertility timing of all births (H1a) is *couple's joint migration status* at each point in time. This categorical variable covers all migration stays of each partner of at least one year of duration. It has five possible outcomes: 'both partners in Senegal', 'man in Europe', 'woman in Europe', 'both in Europe' and 'other' which covers couple-years in which one or both partners were in another country (i.e. none of the four survey countries). The category for both partners being together in Senegal includes couples that have never migrated or migrant couples before—or after for return migrants—the first move of any of the partners. Since the survey only provides yearly information, one cannot be sure what happened first if migration and childbearing occur in the same year. Therefore, I opt for lagging the variable on couple's migration status by one year (t-1) in order to ensure the temporal ordering of events (migration and childbearing). Assuming that a pregnancy takes 9 months, a one-year lag seems an appropriate time interval. The main independent variable in my analysis of first birth risks (H2) is slightly different, since here I am also interested in the duration that both partners stay together in Europe. Hence, the category 'both in Europe' is split into five sub-categories (ranging from 1st year together in Europe to more than 4 years together in Europe). As sexual activity and resulting pregnancies of geographically separated partners may occur also during mutual visits, a dummy variable measuring *visits in t-1* was included. This variable accounts for short returns to Senegal of the migrant partner, as well as holidays of the non-migrant partner in the corresponding country of destination. Unfortunately, this kind of short stays of less than one year is only known for the respondent.

[6] In this article, time-varying means that the variable may take several values throughout the life of a couple. Time-constant means that the value is fixed for each couple. However, it can vary for different partnerships of the same respondent.

Furthermore, several other partnership-related, fertility-related, sociodemographic and other covariates were included in the models. Partnership-related covariates are several dichotomous variables for *being married* (versus consensual union), *having married at a distance*, *first union of the woman and/or the man* (versus higher-order union), and whether the man has *more than one (polygamous) union simultaneously* (versus only one union at the same time)[7]. Fertility-related variables are the *number of years since the previous birth*, which coincides with union duration for the first birth, and serves also as process time for the event history analyses. Moreover, I control for *parities* with the categories '0', '1–2', '3–4' and '5 or higher' (not included in models on first births). Sociodemographic characteristics of both partners are *couple's educational homogamy/heterogamy*. This variable has four possible outcomes: 'both primary education or less', 'man higher educated', 'woman higher educated', or 'both secondary or higher'. I also account for whether the *woman worked* at the time the union was formed (versus being not economically active). To control for rural-urban differences in fertility and migration patterns a variable measuring whether the respondent was *born in the city of Dakar* (versus elsewhere in Senegal). *Religious affiliation*[8] is controlled for, distinguishing between the major Muslim religions 'Tidiane' and 'Mouride', 'other Muslim religions' and 'Christians'. Another covariate that was included in the models is a measure for *period,* which accounts for the observed time period (in decades). Respondents' years of birth and of migration vary considerably (born between 1932 and 1988) and fertility as well as migration patterns changed throughout this period. Furthermore, a dummy variable indicates whether the *man or the woman within each union was interviewed*.

Analysis of fertility quantum

The total number of births within a partnership was predicted as a function of total exposure time defined as the number of years since union formation (Lindstrom and Giorguli-Saucedo 2002) and until age 40 (female respondent) or age 50 (male respondent), separation/divorce of

[7] For male respondents this variable was created according to his union histories; if he had more than one union at the same time the corresponding unions are coded as 'polygamous'. Female respondents were asked whether their husband had other wives at the same time (her co-spouses).

[8] I only know the region of birth and the religious affiliation of the respondent; however, I can conclude that in most cases both partners were born the same region and have the same religion. Marriages tend to be endogamous within religions (Bass and Sow 2006).

the couple, death of one of the partners, or until the interview.[9] The dependent variable is a measure for the number of children born within each union of the respondent and ranges from 0 to 12, with a mean of 2.6 for non-migrant couples, 1.6 and 1.1 for couples in which only the man or the woman, respectively, migrated and 1.8 in case both had migrated. As this variable is count data, Poisson regression models are used. The data is over-dispersed (variance almost doubles the mean), which means that Negative Binomial Regression analysis would be recommended (Cameron and Trivedi 2009). However, using this method does not change the results. Instead, I follow Cameron and Trivedi (2009) and use Poisson regressions with robust standard errors to control for mild violations of the equidispersion assumption. Standard errors are clustered on the individual level.

Time-varying covariates cannot be incorporated in the Poisson models. Instead, several summary measures of couples' combined migration experience are included. To study H1b on the long-term effects of couple's separation and disrupted fertility, I employ a variable accounting for the *total number of years the couple was separated* due to migration of one of the partners to Europe (Model 1, Table 3). This categorical variable distinguishes between non-migrant couples and migrant couples who were separated for different time periods ('never separated', '1–3', '4–6', '7–9', and '10 or more' years separated, and 'other' for other kinds of geographic separations). Since in most cases the separation of partners is the result of men's solo migration to Europe, this variable is also a close measure for male migration experience at destination (Lindstrom and Giorguli-Saucedo 2002). To test H3 on adaptation I include a variable for the *total number of years the couple spent together in Europe* (Model 2, Table 3). It is a categorical variable distinguishing between non-migrant couples and migrant couples' experience together at destination. Since women's duration of stay at destination is more important for fertility adaptation of migrants (Lindstrom and Giorguli-Saucedo 2002), the variable measures the time she spent in Europe ('woman never in Europe', '1–3', '4–6', '7–9', and '10 or more years' in Europe). Furthermore, to test the hypothesis on selection on unobservable characteristics (H4b) a variable is added that measures whether the respondent, at the beginning of his/her stay, *intended to stay temporarily or permanently* in the destination country ('non-migrant', 'temporary

[9] As a robustness check, I also computed completed fertility only for those couples, in which the respondent was at least 40 (women) or 50 (men) years old. Poisson regressions with this reduced sample (665 on-going and past unions of 584 respondents) show very similar results both in size and magnitude of the effects (see Table 6 in the Appendix)

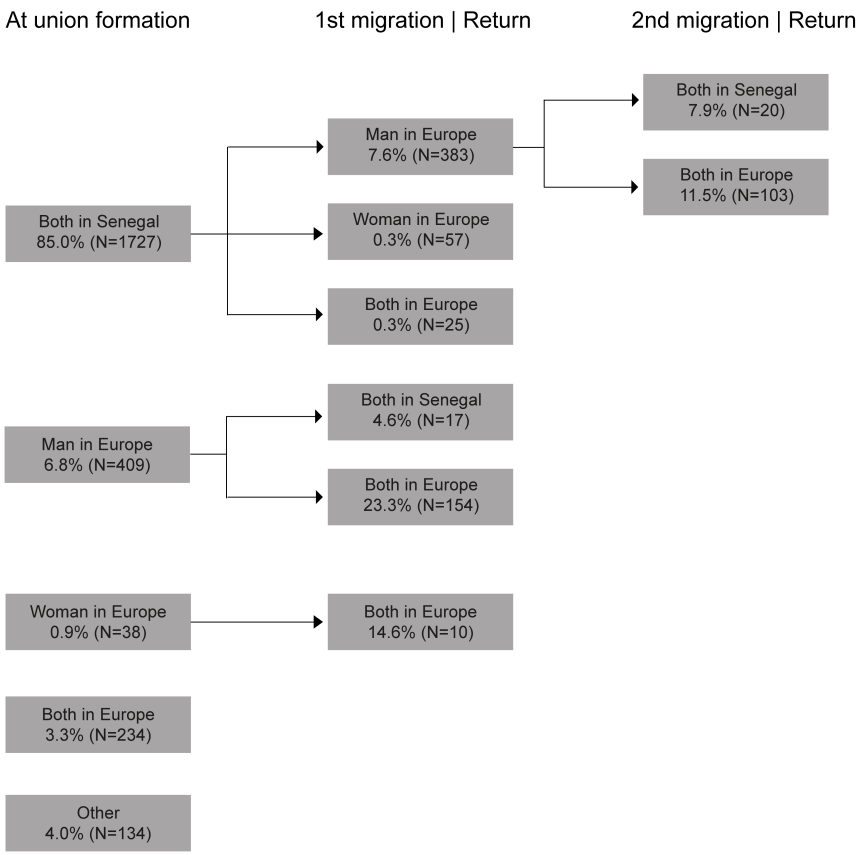
migrant', 'permanent migrant') (Model 3, Table 3).[10] Additionally, in all three models a variable for the *total number of visits* during times of separation is included, and Models 2 and 3 include a measure for the *total number of years the couple was separated* throughout the couple's history due to migration of one of the partners. Furthermore, the analyses account for most of the time-constant partnership-related, sociodemographic and other covariates that were also included in the models for fertility timing.

3.5 Results

Figure 1 and Table 1 present descriptive information on the couples contained in the sample. Figure 1 displays the whereabouts of both partners at union formation. 85 per cent of the unions are formed with both partners being in Senegal and almost eight per cent are formed at a distance—the vast majority with the man residing in Europe. Out of the first type of couples around eight per cent end up in a transnational union, and 11.5 per cent of these couples reunify later on at destination. Moreover, almost one forth of the relationships formed across borders are followed by subsequent migration of the other partner—in this case mostly women—which can be interpreted as marriage migration. Marriage migrants can also be found among the couples in which both partners already reside in Europe at union formation (3.3 per cent), which migrated to Europe just one year earlier. Table 1 provides the sample characteristics of the MAFE survey used for the analyses by type of lifetime migration status. With regards to sociodemographic characteristics, the data indicates selection by observable characteristics—more highly educated couples are more likely to migrate to Europe. Particularly women's education seems an important predictor for female migration, both for independent and partner-related migration, as has been found in previous studies based on the same data (Toma and Vause 2013). Working women are also more likely to migrate independently.

[10] I only know for the respondent if his/her intention was to stay permanently. However, I conclude that this also applies for the partner, in case he/she also migrates. Moreover, I do not know the intended duration of stay at destination for the migrant partners of respondents who were interviewed in Senegal. These are included in the 'missing' category in the analysis.

Figure 1. Distribution of couples' combined migratory status at union formation and, if occurring, after first and second (return) migration of any partner throughout couple history.



Data: MAFE-MESE Biographic Survey; *Note*: N refers to the number of couples in each situation; total number of couples in the year of union formation: 2542; percentages in the second/third column refer to the share of couples from first/second column that undergo an out- or return migration; situations with less than 10 couples are not displayed.

Table 1. Descriptive statistics of dependent and independent variables by couples' migration status.

		Couple-years (percentages)				
	Who ever migrated?	**None**	**Man**	**Woman**	**Both**	**Total**
DEPENDENT						
All births (nr. of events)		277	117	281	118	541
First births (nr. of events)		807	477	130	463	187
Children ever born (mean) *		2.6	1.6	1.1	1.8	2.4
INDEPENDENT						
Migration-related covariates						
Couple's migration status (t-1,	*Not (yet) migrated*					79.2
	Man alone in Eur					8.4
	Woman alone in Eur					0.5
	1st yr. both in Eur					0.5
	2nd yr. both in Eur					0.5
	3rd yr. both in Eur					0.4
	4th yr. both in Eur					0.4
	>4 yrs. both in Eur					2.5
	Other					7.6
Duration of separation (tc)*	*Non-migrant couple*					73.7
	Mig couple, never					3.5
	1–3 yrs. sep.					5.2
	4–6 yrs. sep.					3.6
	7–9 yrs. sep.					2.6
	10+ yrs. sep.					3.8
	Other					7.6
Woman's duration in Eur	*Non-migrant couple*					73.7
	Mig couple, woman					12.6
	woman 1–3 yrs. in					0.8
	woman 4–6 yrs. in					1.1
	woman 7–9 yrs. in					1.1
	woman 10+ yrs. in					3.1
	Other					7.6
Intended duration migration	*Non-migrant couple*					73.7
	Temporary					8.3
	Permanent					6.4
	Other					7.6
	Missing					4.0
Visit (t-1, tv)		0	7.1	1.0	1.8	1.1
Total time separated (years,		0	6.3	1.6	2.6	1.1
Partnership-related						
Married (tv)		89.7	85.4	72.4	84.1	88.5
Marriage at a distance (tc)		0.0	26.9	18.0	43.0	6.7
First union woman (tc)		86.6	94.9	83.5	88.3	87.8

First union man (tc)		67.4	68.2	73.3	75.3	68.1
Polygamous union (tc)		45.4	44.5	21.6	24.2	43.5
Fertility-related covariates						
Parity (tv)	*0*	29.9	36.6	50.9	36.7	31.5
	1 to 2	30.5	40.1	34.3	40.7	32.5
	3 to 4	20.2	17.7	11.0	15.5	19.5
	5 or higher	19.4	5.6	3.8	7.1	16.5
Socio-demographic						
couple's education (tc)	*Both primary*	59.7	40.2	19.7	28.8	54.5
	Man higher	21.1	28.3	12.4	15.5	21.6
	Woman higher	5.1	7.5	21.7	12.5	6.1
	Both secondary or	10.5	23.1	43.8	41.3	14.7
	Missing	3.6	0.9	2.4	1.9	3.1
Woman worked at union		23.8	25.2	23.7	35.2	24.7
Born in city of Dakar (tc)	*Yes*	90.2	82.2	76.2	74.8	87.9
	No	4.6	15.9	21.6	20.9	7.4
	Missing	5.1	1.9	2.2	4.3	4.6
Religion (tc)	*Tidiane*	48.4	39.0	27.2	38.1	46.2
	Mouride	34.7	39.8	45.4	22.7	34.7
	Other Muslim	11.2	16.9	9.5	17.2	12.3
	Christian	5.5	1.7	3.3	10.8	5.4
	Missing	0.2	2.6	14.6	11.3	1.5
Other covariates						
Period (tv)	*Before 1980*	19.8	5.6	15.2	9.2	17.1
	1980-1984	9.4	5.4	7.7	7.5	8.8
	1985-1989	11.4	8.9	10.7	10.2	11.0
	1990-1994	12.5	13.9	11.0	13.2	12.7
	1995-1999	13.6	19.6	17.4	17.2	14.7
	2000-2004	17.7	23.7	16.2	22.4	18.8
	2005-2012	15.5	22.9	21.7	20.3	16.9
Respondent (tc)	*Woman*	57.7	24.6	83.9	46.9	52.9
Couple-years		**132**	**829**	**182**	**776**	**311**
Couples		**105**	**701**	**195**	**587**	**254**

Data: MAFE-MESE Biographic Survey, couple-years are unweighted, percentages are weighted; *Note*: tv: time-varying; tc: time-constant at couple level; * based on sample for completed fertility, all the other measures are based on sample for analysis of fertility timing.

3.5.1 Multivariate results on fertility timing

First, I analysed the birth transitions of couples to test whether the rates of having a(nother) child vary according to the migrant status of both partners. I hypothesized that geographic separation of partners will lead to lower birth probabilities and a disruption in fertility compared to couples with both partners in Senegal (H1a). Model 1 in Table 2 presents the estimates for the discrete-time hazard models of the transition to a child according to migration status and controlling for a range of other covariates. Separation of couples—i.e. the male or the female partner is alone in Europe—during the preceding year results in significantly lower birth probabilities in the year after. Men's solo migration leads to almost 50 per cent lower odds of having a child, and female outmigration has an even stronger negative effect, despite being a less frequent phenomenon. This is in line with the expectations in H1a: separation due to the migration of one partner to Europe reduces the likelihood of having a new child. The coefficients also show that couples with both partners together in Europe, although they are not separated, have 13 per cent lower odds of a birth compared to couples that are together in Senegal (i.e. non-migrants, future and return migrants). The category of other separations, which includes mainly migrations of one of the partners to neighbouring African countries, does not affect birth probabilities, as this kind of migration tends to be of more circular or short-term character. As for partnership-related characteristics, married couples have a 3.09 times higher probability of having a child compared to consensual unions. Surprisingly, unions formed across borders have a higher risk of having a child than non-migrant couples. Women experience a faster transition to a birth when they are in their first union, while for men the union number has no significant effect on childbearing risks. Men with more than one wife have slightly lower birth probabilities, which is in line with previous research (Agadjanian et al. 2011). The fertility-related covariates also showed significant results. The more time passes after a birth (or since union formation for first births), the lower the probability of having another (first) child. Moreover, the probabilities for a birth decrease with parity. Turning to the sociodemographic characteristics, the results show that couples in which the woman is more highly educated than the man, and couples with two highly educated partners, have lower odds of a birth than less-educated couples. Hence, education is an important predictor for birth transitions, as well as female employment status at the onset of the relationship, as women who worked at union formation experience lower birth probabilities. The urban background of couples seems not associated with birth risks, but religion is. Members of the Mouride brotherhood have significantly lower birth risks than those affiliated to the Tidiane religion. With regards to the time period, in recent years birth transitions slowed down, indicating a slow decline in fertility rates in common with

the fertility transition happening in many sub-Saharan African countries. The positive effect of female respondents on birth risks can be explained with the sampling strategy.

Second, I analysed first-birth behaviour separately, as the timing of having a first child has been found to follow distinct patterns compared to higher-order births, mainly due to marriage migration. I anticipated that couples participating in marriage migration will make a faster transition to a first child shortly after reunification at destination compared to couples that have not (yet) migrated, accounting for union duration. The second column in Table 2 (Model 2) presents the exponentiated coefficients for the transition to a first birth. Partners who are the first and the second year together in Europe have a very fast transition to a first birth, controlling for union duration. H2 can thus be confirmed; individuals that reunify at destination to form a union have, in fact, an elevated risk of having a first child in their very first years at destination compared to couples that did not migrate (yet), accounting for union duration. In line with the results on all births in Model 1, couples that are separated as a result of the outmigration of the man or the woman have significantly lower first birth risks than couples with both partners in Senegal. Most of the other covariates show similar effects both in magnitude and significance as in my analysis of birth risks in Model 1. Apparently, many firstborn children are conceived during a visit in the case of geographically separated couples. Again, marriage is a strong indicator for a fast transition to a first child. Women have a faster first birth transition when they are in their first union, and this effect reaches statistical significance for men as well. Related to the sociodemographic characteristics, interestingly, educational attainment of both partners and female labour force status at union formation seem unrelated to first birth timings. This shows that, for individuals that are selected into a partnership, having one child is nearly universal, independent of partners' socioeconomic status.

Table 2. Fertility timing: Discrete-time hazard models predicting a (first) birth in a given year; odds ratios

		Model 1	Model 2
Couple's migration status (t-1) (Ref: Not (yet) migrated)	*Man in Eur*	0.51*** (0.03)	
	Woman in Eur	0.40*** (0.07)	
	Both in Eur	0.77*** (0.04)	
	Other	0.90 (0.05)	
Couple's migration status (t-1) (Ref: Not (yet) migrated)	*Man alone in Eur*		0.47*** (0.06)
	Woman alone in		0.53** (0.12)
	1st yr. both in Eur.		1.52** (0.22)
	2nd yr. both in Eur.		1.50* (0.27)
	3rd yr. both in Eur.		1.15 (0.26)
	4th yr. both in Eur.		0.66 (0.22)
	>4 yrs. both in Eur.		0.73 (0.18)
	Other		1.01 (0.12)
Visit (t-1)		1.40* (0.18)	1.59* (0.30)
Married		3.09*** (0.24)	4.15*** (0.35)
Union formation at distance		1.22*** (0.06)	1.41** (0.16)
First union woman		1.31*** (0.08)	1.40*** (0.13)
First union man		1.05 (0.04)	1.29*** (0.09)
Man has several wives		0.91* (0.04)	1.02 (0.07)
Time since last birth/since union f.		0.93*** (0.01)	0.94*** (0.01)
Parity (Ref: 1-2)	*0*	1.12** (0.04)	
	3-4	0.74*** (0.03)	
	5+	0.62*** (0.03)	

Couple's education (Ref: Both primary education or less)	*Man higher*	0.95	1.10
		(0.04)	(0.08)
	Woman higher	0.86**	0.87
		(0.05)	(0.09)
	Both Secondary or higher	0.83***	0.98
		(0.04)	(0.07)
Woman worked at union formation		0.92*	0.94
		(0.04)	(0.06)
Dakar origin		0.91	1.03
		(0.04)	(0.09)
Religion (Ref: Tidiane)	*Mouride*	0.88***	0.86*
		(0.03)	(0.05)
	Other Muslim	0.99	0.88
		(0.05)	(0.07)
	Christian	0.97	0.89
		(0.07)	(0.13)
Period (Ref: 1995-1999)	*Before 1980*	1.33***	0.95
		(0.09)	(0.10)
	1980-1984	1.21**	0.98
		(0.07)	(0.11)
	1985-1989	1.24***	1.11
		(0.07)	(0.10)
	1990-1994	1.19***	1.18
		(0.06)	(0.11)
	2000-2004	0.96	1.04
		(0.04)	(0.09)
	2005-2012	0.84***	0.91
		(0.04)	(0.08)
Wife=respondent		1.20***	1.18**
		(0.04)	(0.07)
N (couple-years)		**31,123**	**10,510**

Data: MAFE-MESE Biographic Survey, unweighted; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; *Note:* Exponentiated coefficients; Standard errors in parentheses; Missing values in the independent variables are included in the models but coefficients are not presented.

3.5.2 Multivariate results on completed fertility

Table 3 presents the coefficients for completed fertility. In Model 1 I test the effect of the cumulative separation of couples on the number of children a couple has. I hypothesized a negative relationship between the duration of separation and completed fertility (H1b). All types of migrant couples have significantly fewer children than their non-migrant counterparts, and the longer the separation of the couple, the lower their fertility level. Thus, although not statistically significant, these results suggest that the longer partners are separated, the lower their completed fertility.

Regarding migrant adaptation, I expected that, over time, migrant couples adapt to the childbearing patterns prevalent at destination and therefore have lower fertility compared to non-migrants (H3). This is tested in Model 2 (Table 3). Overall, migrant couples have fewer children compared to non-migrant couples. Furthermore, there is a negative relationship between the time that both partners are together at destination—accounting for the duration of stay of the female partner—and the number of children, with the exception of couples that spend very little time together at destination. A gradual adaptation towards lower fertility levels at destination can be observed, although the differences are not statistically significant.

The effects of the control variables correspond largely to the expectations and are essentially the same for all three models of Table 3. The total number of visits during times of separation is not related to the total number of children. As for the partnership-related covariates, partners who got married during their partnership have significantly more children than unmarried couples. Partners that formed their union at a distance have more children than non-migrant couples, and women in their first union have more children than women in higher-order unions. However, men in their first union do not have more children than in higher-order partnerships. Polygamous husbands have slightly fewer children in each union compared to monogamous men. Regarding the sociodemographic variables, more highly educated couples and women who worked at the time of union formation have a lower completed fertility. Furthermore, the coefficients show that urban couples coming from the Dakar area and couples belonging to the Mouride brotherhood have significantly fewer children than rural couples and members of the Tidiane brotherhood, respectively. Finally, couples in which the woman participated in the interview have more children than couples in which the man did the survey, which might be explained by the sampling of the migrants (see data section).

Table 3. Completed fertility: Poisson regression models predicting total number of births; incidence rate ratios; all couples

		Model 1	Model 2	Model 3
Duration of separation (Ref: Non-migrant couple)	*Never separated*	0.69***		
		(0.04)		
	1-3 yrs separated	0.81***		
		(0.04)		
	4-6 yrs separated	0.73***		
		(0.04)		
	7-9 yrs separated	0.62***		
		(0.04)		
	10+ yrs separated	0.62***		
		(0.03)		
	other separation	0.96		
		(0.04)		
Woman's duration at destination (Ref: Non-migrant couple)	*Woman never in Eur*		0.78***	
			(0.04)	
	Woman 1-3 yrs in Eur		0.89	
			(0.07)	
	Woman 4-6 yrs in Eur		0.83**	
			(0.06)	
	Woman 7-9 yrs in Eur		0.80***	
			(0.05)	
	Woman 10+ yrs in Eur		0.70***	
			(0.03)	
	Other		0.96	
			(0.04)	
Intended duration of migration (Ref: Non-migrant)	*Temporary migration*			0.76***
				(0.04)
	Permanent migration			0.72***
				(0.03)
	Other			0.96
				(0.04)
Total nr. of visits		1.01	1.01	1.02
		(0.01)	(0.02)	(0.02)
Total time separated (years)			0.99***	0.99***
			(0.00)	(0.00)
Married		2.13***	2.13***	2.10***
		(0.17)	(0.17)	(0.17)
Union formation at distance		1.09*	1.12**	1.10**
		(0.04)	(0.04)	(0.04)
First union woman		1.24***	1.25***	1.25***
		(0.06)	(0.06)	(0.06)
First union man		1.02	1.03	1.02
		(0.04)	(0.04)	(0.04)
Man has several wives		0.92*	0.93*	0.92*
		(0.03)	(0.03)	(0.03)

Couple's education	*Man higher*	0.96	0.95	0.95
(Ref: Both primary edu. or less)		(0.03)	(0.03)	(0.03)
	Woman higher	0.90*	0.90*	0.89*
		(0.04)	(0.04)	(0.04)
	Both Secondary or higher	0.86***	0.85***	0.85***
		(0.03)	(0.03)	(0.03)
Woman worked		0.93*	0.93*	0.93*
		(0.03)	(0.03)	(0.03)
Dakar origin		0.92*	0.92*	0.92*
		(0.04)	(0.04)	(0.04)
Religion	*Mouride*	0.89***	0.89***	0.90***
(Ref: Tidiane)		(0.03)	(0.03)	(0.03)
	Other Muslim	1.01	1.00	1.00
		(0.04)	(0.04)	(0.04)
	Christian	0.93	0.91	0.93
		(0.06)	(0.06)	(0.06)
Period	*Before 1980*	1.27**	1.26**	1.27**
(Ref: 1995-1999)		(0.11)	(0.11)	(0.11)
	1980-1984	0.99	0.99	0.98
		(0.14)	(0.14)	(0.13)
	1985-1989	1.05	1.04	1.04
		(0.09)	(0.09)	(0.09)
	1990-1994	0.98	0.99	0.99
		(0.07)	(0.07)	(0.07)
	2000-2004	0.89	0.88*	0.89
		(0.05)	(0.05)	(0.05)
	2005-2012	0.99	0.98	0.99
		(0.05)	(0.05)	(0.05)
Respondent=Woman		1.16***	1.16***	1.15***
		(0.03)	(0.03)	(0.03)
N (couples)		**2542**	**2542**	**2542**

Data: MAFE-MESE Biographic Survey, unweighted; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; *Note:* Exponentiated coefficients; Standard errors in parentheses; Missing values in the independent variables are included in the models but coefficients are not presented.

3.5.3 Multivariate results on migrant selection

With regards to migrant couples' selection on observable characteristics, in all models for fertility timing and completed fertility, a measure for educational attainment of both partners was included. Based on previous evidence, I hypothesized that couples with at least one migrant partner tend to be more highly educated and thereby have a postponed fertility calendar and a lower completed fertility (H4a). In fact, couples in which the woman is more highly educated than the man or in which both are highly educated have a lower risk of experiencing a birth (Model 1 in Table 2). As mentioned above, first birth risks are not affected by the

education of the partners, since having one child seems almost universal after union formation and independent from most socioeconomic and demographic characteristics. Education is also an important predictor for completed fertility. More educated women—and particularly if both partners are highly educated—have a significantly lower number of children compared to less-educated couples (Models 1-3, Table 3). Hence, H4a on educational selectivity was confirmed. However, despite education being an important predictor for fertility timing and quantum of Senegalese couples, it does not fully explain differential fertility patterns between non-migrant and migrant couples.

Neither separation of partners, adaption, nor educational attainment seem to explain entirely why migrants have fewer children than non-migrants, drawing the attention to the importance of migrant selectivity on unobservable characteristics. I expected migrant couples that aspire to stay permanently in Europe to be selected on lower than average fertility (H4b). The coefficients in Model 3 of Table 3 are in line with my expectations, although the difference between permanent and temporary migrants is very small and statistically insignificant. Temporary migrant couples are more similar to non-migrant couples, having a slightly higher number of children than couples with the intention to stay permanently at destination. But overall, the results do not confirm my expectations. It remains to be seen if this variable (temporary vs. permanent migration strategy) is a reliable proxy for capturing unobservable fertility-related characteristics. However, this was the best indicator capturing unobservable characteristics that could be found with the data used. Other unobservable characteristics may explain the remaining differences between migrant and non-migrant couples, such as economic and social mobility aspirations on the one side, and family proneness or preferences for larger families on the other side (Kulu and González-Ferrer 2014; Milewski 2007, 2010). Unfortunately, the MAFE survey does not provide this information.

3.6 Conclusion

Although it is widely recognized that selection is a key determinant in explaining the differential behaviour of migrants compared to non-migrants at origin in terms in several domains, such as fertility, it has rarely been tested empirically. This gap in current research is related to the fact that suitable data sources are not available. Bi-national representative surveys sampling migrants, but also individuals who never left the country of origin are scarce, and have been carried out mainly in

the Mexico-US migratory system. The MAFE survey gave me the unique opportunity to perform this kind of analysis for another migratory setting, namely Sub-Saharan African migration to Europe. This study aimed at testing empirically whether Senegalese migrants in Europe are a selected group in terms of fertility, when compared to non-migrants at origin by taking the couple as unit of analysis. In order to disentangle selection effects determining the fertility behaviour of couples, also other mechanisms explaining migrant fertility were examined (disruption, interrelatedness of events and adaptation), as several of them may be at work either simultaneously or sequentially. Overall, evidence has been found for both differences in fertility timing and completed fertility between migrant and non-migrant couples.

A strong disruptive effect of migration on childbearing risks could be observed, clearly related to the geographic separation of couples due to the out-migration of one of the partners. Migrant couples are less likely to experience a birth in a given year compared to non-migrant couples when one of the partners—mostly the man—was in Europe in the prior year. This is true for first births as well as all births in general. This result is consistent with previous research on couple separation in the Mexico-US migratory system (Lindstrom and Giorguli-Saucedo 2002, 2007). The couples perspective taken in this study made it possible to link disrupted fertility undoubtedly to the separation of partners, which in other studies focussing on only the mother (or the father) proved to be difficult.

Increased first birth risks, however, could be observed for migrant couples in the first two years that both partners are together at destination when controlling for union duration. This reinforces the importance of taking into account *both* parents' whereabouts in order to interpret correctly increased or disrupted childbearing in the years before and after migration. Furthermore, the fast transitions to a first child immediately after being together at destination confirm for Senegalese migrants what has been found for marriage migrants of other geographic contexts.

With regards to completed fertility, migrant couples have significantly fewer children throughout their life course compared to their non-migrant counterparts. Part of this difference can surely be explained with prolonged couple separation making fertility recovery difficult or impossible. Although not statistically significant, the findings suggest that the longer partners are separated, the lower their completed fertility. This is in contrast to what Lindstrom and Giorguli-Saucedo (2002) found for the Mexican-US migratory context, that couples were able to "adjust" and "compensate" their fertility after returning to Mexico. Another part of the lower fertility of migrant couples can be explained with adaptation processes towards lower fertility levels and higher costs of childbearing

and childrearing in European destination countries, although the gradual convergence seems rather slow. I could observe a negative relationship between the time that both partners are together at destination—accounting for the duration of stay of the female partner—and the number of children, although the differences between different durations of stay are statistically not significant.

To account for Senegalese migrants' positive educational selectivity that has been found in other studies (González-Ferrer et al. 2014) and that I expected to contribute also to fertility the differentials between migrant and non-migrant couples, a measure for couples' combined educational level was included in the analyses of fertility timing and quantum. In fact, couples in which the woman is more highly educated than the man or in which both partners are highly educated have a lower risk of experiencing a birth in a given year. Education is also an important predictor for completed fertility. More educated women—and particularly if both partners are highly educated—have significantly fewer children compared to less-educated couples. Thus, in line with similar findings on the fertility of migrants from Ghana to Europe (Wolf and Mulder 2017), the level of education seems an important determinant for differentials in completed fertility of migrants compared to those who never migrated.

However, in the case of Senegal, education does not fully explain these differences. It can be assumed that the remaining differentials in childbearing between migrant and non-migrant couples are the result of selectivity on unobservable characteristics, such as aspirations for social mobility or the preference for a certain number of children. Couples appear to have fixed preferences about their migration strategy and their fertility goals that influence their decisions regarding the type and timing of migration and childbearing. Unfortunately, the attempt to capture unobserved selectivity of migrants by accounting for their desired duration of stay at destination (temporarily vs. permanently) did not show significant differences. Other unobservable features inherent to migrant couples may explain why these couples have lower fertility levels than non-migrant couples, e.g. economic and social mobility aspirations, family proneness or preferences for larger families (Kulu and González-Ferrer 2014; Milewski 2007, 2010). Unfortunately, the MAFE survey does not provide this information.

To sum up, the reasons for lower fertility levels of migrant couples compared to non-migrant couples are various. Firstly, the long geographic distance and restrictive immigration policies might make it more difficult to combine migratory processes with family formation and therefore delay birth transitions. Secondly, the lower completed fertility might be due to the strong educational selectivity of migrants and adaptation processes

going on once both partners are at destination. And thirdly, migrant selection on unobservable characteristics is likely to contribute its share to differential fertility behaviour between non-migrant and migrant couples, although I was not able capture them adequately.

While the current study contributes to the existing research on migrant fertility, several limitations should be mentioned. First, the formulated hypotheses and the analytical approach are based on the assumption that migration shapes fertility behaviour; however, fertility may also influence migration decisions, as has been shown in several studies (Lindstrom and Giorguli-Saucedo 2007; Ribe and Schultz 1980). Births are not only postponed as a consequence of couple separation, but migration may also be initiated or delayed as a result of a birth. Hence, in future research, it would be interesting to jointly estimate the effect of migration on fertility and of fertility on migration, e.g. using simultaneous-equations models. Second, another issue that could not be addressed in this study is the selection into partnerships. For instance, women marrying a (current) migrant, and especially marriage migrants, probably are selected on socioeconomic factors, as well as on their aspirations for marrying a migrant and eventually following him to Europe and having a child there. This double selection process could not be taken into account in this study. However, as the focus is on fertility within relationships, the selection process into a certain type of partnership goes beyond the scope of this study. Third, the MAFE survey provides data only on an annual basis, and thus, the temporal order of events (e.g. birth, migration) that occur in the same year is not clear. To overcome this limitation, the variables on couples' migrant status were lagged one year. Fourth, the models do not control for the specific destination country (Spain, France, Italy), although fertility levels, socioeconomic conditions, as well as the integration of immigrants may vary across countries. Previous findings that also use the MAFE data indicate that migratory flows to the different destination countries differ in their socioeconomic and demographic composition (González-Ferrer and Kraus 2012). Furthermore, Senegalese migration to France has a much more established colonial and migratory history than migration to the other two countries. Notwithstanding these limitations, the current study can give some new perspectives as well as new theoretical and empirical insights to existing theories on family formation of the immigrant population, and especially for migration flows from sub-Saharan Africa to Europe.

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Appendix

Table 4. Fertility timing: Discrete-time hazard models predicting a (first) birth in a given year; male respondents only; odds ratios

Male respondents		**Model 1**	**Model 2**
Couple's migration status (t-1) (Ref: Not (yet) migrated)	*Man in Eur*	0.45***	
		(0.04)	
	Woman in Eur	0.45*	
		(0.17)	
	Both in Eur	0.74***	
		(0.07)	
	Other	0.96	
		(0.11)	
Couple's migration status (t-1) (Ref: Not (yet) migrated)	*Man alone in Eur*		0.41***
			(0.07)
	Woman alone in Eur		0.38
			(0.22)
	1st yr. both in Eur.		1.43
			(0.33)
	2nd yr. both in Eur.		1.30
			(0.39)
	3rd yr. both in Eur.		1.45
			(0.50)
	4th yr. both in Eur.		0.29
			(0.20)
	>4 yrs. both in Eur.		0.60
			(0.26)
	Other		1.04
			(0.21)
Visit (t-1)		1.41*	1.46
		(0.21)	(0.31)
Married		3.48***	4.38***
		(0.40)	(0.58)
Union formation at distance		1.23**	1.57**
		(0.09)	(0.26)
First union woman		1.33*	1.10
		(0.15)	(0.19)
First union man		1.04	1.37**
		(0.06)	(0.14)
Man has several wives		0.89*	1.02
		(0.05)	(0.11)
Time since last birth/since union		0.92***	0.95***
		(0.01)	(0.01)
Parity (Ref: 1-2)	*0*	1.23***	
		(0.07)	
	3-4	0.76***	
		(0.05)	

	5+	0.64***	
		(0.07)	
Couple's education	*Man higher*	0.95	1.21
(Ref: Both primary education or less)		(0.05)	(0.12)
	Woman higher	0.97	0.90
		(0.10)	(0.13)
	Both Secondary or higher	0.79***	0.92
		(0.06)	(0.11)
Woman worked at union formation		0.95	0.97
		(0.06)	(0.10)
Dakar origin		0.91	0.94
		(0.07)	(0.13)
Religion	*Mouride*	0.87*	0.94
(Ref: Tidiane)		(0.05)	(0.08)
	Other Muslim	0.95	0.83
		(0.07)	(0.10)
	Christian	1.10	1.07
		(0.14)	(0.26)
Period	*Before 1980*	1.34*	0.98
(Ref: 1995-1999)		(0.15)	(0.17)
	1980-1984	1.18	1.02
		(0.11)	(0.17)
	1985-1989	1.24*	1.11
		(0.11)	(0.15)
	1990-1994	1.25**	1.27
		(0.09)	(0.17)
	2000-2004	1.03	1.07
		(0.07)	(0.12)
	2005-2012	0.82**	0.86
		(0.06)	(0.11)
Age	*10-19*	0.38***	0.46**
(Ref: 25-29)		(0.09)	(0.12)
	20-24	0.71***	0.76*
		(0.07)	(0.09)
	30-34	1.08	1.10
		(0.08)	(0.12)
	35-39	1.15	1.08
		(0.09)	(0.14)
	40-44	1.02	1.08
		(0.09)	(0.17)
	45-49	0.79*	0.87
		(0.09)	(0.19)
	50-55	0.70*	0.51*
		(0.11)	(0.17)
N (couple-years)		**15015**	**5442**

Data: MAFE-MESE Biographic Survey, unweighted; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; *Note:* Exponentiated coefficients; Standard errors in parentheses; Missing values in the independent variables are included in the models but coefficients are not presented.

Table 5. Fertility timing: Discrete-time hazard models predicting a (first) birth in a given year; female respondents only; odds ratios.

Female respondents		**Model 1**	**Model 2**
Couple's migration status (t-1)	*Man in Eur*	0.57***	
(Ref: Not (yet) migrated)		(0.05)	
	Woman in Eur	0.38***	
		(0.08)	
	Both in Eur	0.85*	
		(0.07)	
	Other	0.85*	
		(0.06)	
Couple's migration status (t-1)	*Man alone in Eur*		0.48***
(Ref: Not (yet) migrated)			(0.08)
	Woman alone in Eur		0.62
			(0.16)
	1st yr. both in Eur.		1.51*
			(0.28)
	2nd yr. both in Eur.		1.61*
			(0.36)
	3rd yr. both in Eur.		1.03
			(0.32)
	4th yr. both in Eur.		0.93
			(0.36)
	>4 yrs. both in Eur.		1.00
			(0.29)
	Other		0.92
			(0.13)
Visit (t-1)		2.41*	2.31
		(1.07)	(1.40)
Married		2.46***	3.37***
		(0.26)	(0.40)
Union formation at distance		1.12	1.18
		(0.08)	(0.19)
First union woman		1.09	1.22
		(0.08)	(0.14)
First union man		1.03	1.12
		(0.06)	(0.12)
Man has several wives		1.00	1.02
		(0.05)	(0.11)
Time since last birth/since union		0.96***	0.95***
		(0.01)	(0.01)
Parity	*0*	1.08	
(Ref: 1-2)		(0.06)	
	3-4	0.81***	
		(0.05)	
	5+	0.94	
		(0.08)	
Couple's education	*Man higher*	0.94	0.95
(Ref: Both primary education or less)		(0.05)	(0.10)

	Woman higher	0.82**	0.84
		(0.06)	(0.12)
	Both Secondary or higher	0.87*	0.92
		(0.05)	(0.09)
Woman worked at union formation		0.92	0.96
		(0.04)	(0.08)
Dakar origin		0.91	1.08
		(0.06)	(0.11)
Religion	*Mouride*	0.87**	0.76**
(Ref: Tidiane)		(0.04)	(0.07)
	Other Muslim	1.03	0.95
		(0.07)	(0.12)
	Christian	0.89	0.80
		(0.08)	(0.14)
Period	*Before 1980*	1.28**	0.97
(Ref: 1995-1999)		(0.11)	(0.15)
	1980-1984	1.19*	0.96
		(0.10)	(0.15)
	1985-1989	1.24**	1.16
		(0.09)	(0.16)
	1990-1994	1.13	1.11
		(0.08)	(0.15)
	2000-2004	0.94	1.05
		(0.06)	(0.13)
	2005-2012	0.98	1.09
		(0.07)	(0.15)
Age	*10-19*	0.78**	0.82
(Ref: 25-29)		(0.07)	(0.11)
	20-24	1.06	1.12
		(0.06)	(0.11)
	30-34	0.93	0.92
		(0.05)	(0.12)
	35-39	0.64***	0.56**
		(0.05)	(0.10)
	40-44	0.32***	0.20***
		(0.04)	(0.06)
	45-49	0.05***	0.11*
		(0.03)	(0.11)
N (couple-years)		**16108**	**5068**

Table 6. Completed fertility: Poisson regression models predicting total number of births; incidence rate ratios (only couples in which the respondent was at least 40 (women) or 50 (men) old at survey).

		Model 1	Model 2	Model 3
Duration of separation (Ref: Non-migrant couple)	*Never separated*	0.69***		
		(0.07)		
	1-3 yrs separated	0.83*		
		(0.08)		
	4-6 yrs separated	0.80*		
		(0.08)		
	7-9 yrs separated	0.63***		
		(0.07)		
	10+ yrs separated	0.75***		
		(0.06)		
	Other separation	1.05		
		(0.07)		
Woman's duration at destination (Ref: Non-migrant couple)	*Woman never in Eur*		0.80*	
			(0.09)	
	Woman 1-3 yrs in Eur		0.92	
			(0.14)	
	Woman 4-6 yrs in Eur		0.77*	
			(0.10)	
	Woman 7-9 yrs in Eur		0.76*	
			(0.08)	
	Woman 10+ yrs in Eur		0.73***	
			(0.06)	
	Other		1.05	
Intended duration of migration (Ref: Non-migrant)	*Temporary migration*			0.76**
				(0.07)
	Permanent migration			0.72***
				(0.06)
	Other			1.05
				(0.07)
Total nr. of visits		1.00	1.00	1.01
		(0.02)	(0.02)	(0.02)
Total time separated (years)			1.00	0.99
			(0.01)	(0.00)
Married		2.31***	2.31***	2.28***
		(0.59)	(0.56)	(0.55)
Union formation at distance		1.05	1.10	1.08
		(0.07)	(0.08)	(0.07)
First union woman		1.33***	1.34***	1.34***
		(0.11)	(0.11)	(0.11)
First union man		1.00	1.00	1.00
		(0.05)	(0.06)	(0.06)

Man has several wives		0.96	0.97	0.96
		(0.05)	(0.05)	(0.05)
Couple's education	*Man higher*	0.99	0.98	0.96
(Ref: Both primary education or		(0.05)	(0.05)	(0.05)
	Woman higher	0.99	0.99	0.97
		(0.09)	(0.09)	(0.09)
	Both Secondary or	0.86*	0.86*	0.84**
		(0.06)	(0.05)	(0.06)
Woman worked at union		0.93	0.92	0.92
		(0.06)	(0.06)	(0.06)
Dakar origin		0.77***	0.76***	0.77***
		(0.06)	(0.06)	(0.06)
Religion	*Mouride*	0.85***	0.84***	0.85**
(Ref: Tidiane)		(0.04)	(0.04)	(0.04)
	Other Muslim	1.04	1.04	1.05
		(0.07)	(0.07)	(0.07)
	Christian	1.05	1.05	1.07
		(0.10)	(0.10)	(0.11)
Period	*Before 1980*	0.87	0.87	0.83
(Ref: 1995-1999)		(0.18)	(0.18)	(0.16)
	1980-1984	1.20	1.20	1.19
		(0.15)	(0.15)	(0.15)
	1985-1989	1.04	1.04	1.03
		(0.11)	(0.11)	(0.10)
	1990-1994	1.06	1.06	1.05
		(0.08)	(0.08)	(0.08)
	2000-2004	1.05	1.07	1.06
		(0.07)	(0.07)	(0.07)
	2005-2012	0.98	0.99	1.00
		(0.06)	(0.06)	(0.06)
Respondent=Woman		1.23***	1.23***	1.22***
		(0.06)	(0.06)	(0.06)
N (couples)		**665**	**665**	**665**

Data: MAFE-MESE Biographic Survey, unweighted; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; *Note:* Exponentiated coefficients; Standard errors in parentheses; Missing values in the independent variables are included in the models but coefficients are not presented.

CHAPTER 4:

Does migrant background matter for adolescents' fertility preferences? The Latin American 1.5 generation in Spain

Abstract

This article examines the fertility preferences of Latin American adolescents of the 1.5 generation and their native peers in Spain. We compare their expected age at first birth as well as their expected family size. The fertility preferences of the 1.5 generation are likely to reflect the family values of two different socialization environments as well as the adaptation process to the childbearing norms of the host society. The analysis is based on the Chances Survey, which collected data from 2,700 adolescents in secondary schools in Madrid in 2011. Results indicate that fertility timing preferences of Latin American adolescents reflect socialization influences from the society of origin, but also a quick adaptation to the childbearing norms in the host society, since their expected age at first birth is somewhat earlier than that of their Spanish peers but considerably later than that prevailing in their country of origin. The degree of social integration, measured by the number of the respondent's best friends who were Spanish, seems more important than age at migration for diminishing the gap between Latin Americans and Spaniards. Moreover, higher educational expectations are associated with preferences for postponed entry into parenthood. With regard to family size expectations, we find no significant variation between adolescents of migrant and native origin, confirming the argument that the 'two-child norm' currently prevails in both middle- and high-income countries.

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4.1 Introduction

As immigrants play an increasingly important role in the demographic, social and cultural trends of European societies, there is a growing interest in their family dynamics. While the fertility patterns of immigrants in European countries have received considerable attention in the recent demographic literature (Andersson 2004; Kulu 2005; Kulu and González-Ferrer 2014; Milewski 2007; Wolf 2016), their descendants' family formation preferences and behaviour—including those of the so-called 1.5 generation[1]—have been less studied (De Valk 2013; De Valk and Liefbroer 2007a, 2007b; De Valk and Milewski 2011; Kulu et al. 2015; Milewski 2010).

The main focus of research on migrant fertility has been on assessing the influence of past and current social environments and disentangling the role of socio-economic and cultural factors in shaping migrants' childbearing patterns (Kulu and González-Ferrer 2014). For instance, a central question surrounding recent discussions on Hispanic fertility in the US is whether observed differentials with respect to native fertility stem from disparities in socio-economic position or from cultural norms related to family life and the value attached to children (Hartnett and Parrado 2012).

Several major hypotheses have been proposed in the literature to depict the interrelationship between migration and fertility: disruption, interrelation of events, selection, socialization and adaptation (Andersson 2004; Kulu 2005; Kulu and González-Ferrer 2014; Milewski 2007). In general, these hypotheses aim to explain and predict how migrants coming from countries with relatively high and early fertility behave after moving to countries with low and late fertility. These hypotheses have been empirically tested in the US context (Lindstrom and Giorguli-Saucedo 2002; Parrado and Morgan 2008; Singley and Landale 1998) as well as in several European destination countries (Andersson 2004; Kulu 2005; Milewski 2007, 2011), and it appears that their relative importance varies across immigrant groups and also across socio-economic, institutional and policy settings (Kulu and González-Ferrer 2014).

The selection, socialization and adaptation hypotheses have also been used to interpret the childbearing patterns of migrants' offspring.

[1] The terms *1.5 generation* and *child migrants* are used interchangeably throughout this article. Both terms refer to individuals who were born abroad and who migrated (with one/both parents or following them) during childhood or adolescence.

Although self-selection mechanisms are less relevant for migrants' descendants—they do not make the decision to migrate—the indirect influence of parental selective migration should not be overlooked. Migrant parents tend to be positively selected in terms of socio-economic resources, educational attainment, and social mobility aspirations for themselves and their children (Adserà et al. 2012; Feliciano 2005), which may in turn influence their children's educational, employment and fertility preferences. Moreover, the relative influence of socialization and adaptation processes on reproductive norms and behaviour is difficult to disentangle, both for the second and 1.5 generations. The second generation is born and raised in the host country, but within an immigrant family, which plays an important role in the intergenerational transmission of cultural values (Milewski 2007, 2011). Members of the 1.5 generation occupy a "socio-cultural middle ground" (Holland and De Valk 2013) between their countries of origin and destination, and we can presume that their family formation norms and behaviour are shaped by both societal contexts.

A different body of literature deals with adolescents' fertility preferences in ethnically or racially diverse societies. Most of the existing studies focus on the US and attribute racial-ethnic differences in adolescents' fertility preferences to divergences in cultural values and in parental socio-economic status (Plotnick 2007; Starrels and Holm 2000; Trent 1994). However, the US literature on adolescents' reproductive preferences tends to focus on racial-ethnic disparities rather than on the comparison of native and foreign-born adolescents.

This paper brings the literature on migration and fertility into conversation with the literature on adolescents' fertility preferences by addressing the following research questions: *Do adolescents' preferences about their future family size and age at first birth differ by migrant status? Do child migrants gradually adapt their fertility preferences towards those of natives with longer duration of stay at destination? Which migration-related, family-related or individual characteristics contribute to these differences?*

Research on adolescents in Spain, and particularly on adolescents of immigrant families, has been severely limited by lack of available data. Our empirical analysis draws on a new dataset, the *Chances Survey*, collected in 30 secondary schools in Madrid during the first half of 2011, and focuses on the Latin American 1.5 generation. Spain, a relatively new immigration country with lowest-low and latest-late fertility patterns, is an interesting case to study. Although Spain and Latin American countries have traditionally shared similar cultural features, such as language, Catholic religion and familistic values, both settings differ considerably as

regards their family formation patterns. Latin American first-generation immigrant women have maintained many of the family patterns of their countries of origin. They tend to enter younger in union, usually through cohabitation, to have more children—although this was so only up to the onset of the economic crisis—and to have a much earlier fertility calendar than their Spanish counterparts. However, it is not known whether these patterns persist for the 1.5 and second generation.

The Latin American second generation, born in Spain to two Latin American-born parents, is still a rather small group with a very young age profile—mean age of 9.5 in the 2011 Census. Most of them have yet to reach their reproductive age. In contrast, the Latin American 1.5 generation had a mean age of 17.9 by the 2011 Census. By looking at the reproductive preferences of the 1.5 generation, we will be able to gain valuable insights into the socialization influences and the on-going adaptation processes, which might in turn shed some light on the second-generation's future fertility behaviour.

The contributions of this article are twofold. First, from a theoretical perspective, we discuss to what extent existing theories on the interrelationship between migration and fertility are pertinent to migrants of the 1.5 generation. Second, the empirical comparison of fertility quantum and timing preferences of foreign-born and native adolescents advances our understanding of the process of social and cultural integration of child migrants in a recent immigration setting.

4.2 Background

4.2.1 The emergence of the Latin American 1.5 generation in Spain

Spain has been traditionally a country of out-migration, but at the turn of the 21st century it became one of the major immigrant receiving countries in Europe. The share of the foreign-born population increased steeply from 2.3 per cent in 2000 to 14.4 per cent in 2011, although afterwards it declined slightly to 13.2 per cent in 2015 due to return migration linked to the economic crisis (INE 2016). When clustering countries by continents, Latin Americans are the largest foreign-born population group in Spain. Latin American flows to Spain are predominantly labour migration flows and highly feminized, partly due to the large demand in the Spanish labour market for domestic service and care workers (Bueno García and

Vono de Vilhena 2009). These flows were intensified due to exemptions of many Latin American countries from visa requirements (Oso Casas 2010). On the other hand, in Ecuador, the main origin country of Latin American migrants in Spain, a deep economic crisis, rising poverty and high political instability functioned as push factors for outmigration during the late 1990s and early 2000s (Gabrielli 2015). In other countries, such as Peru or Colombia, structural adjustment programs imposed by global financial institutions to transform the economy along neoliberal lines provoked a fall in employment, wages and living standards, also boosting emigration flows (Massey and Capoferro 2006).

At first, high rates of female outmigration resulted in transnational families and new arrangements of kinship and foster care, as mothers temporarily left their children in the care of spouses, relatives and friends in the origin countries. But over the years, often in anticipation of an imminent implementation of stricter visa requirements, many women brought over their husbands and children for the purpose of settlement (Oso Casas 2010). The process of family reunification was particularly rapid in the case of Spain, although it largely took place at the fringes of the legal family reunification procedure (González-Ferrer 2011). The result was a growing Latin American 1.5 generation, children born in Latin America who migrated with or followed their parents to Spain (Aparicio 2007). According to the 2011 Census, the largest Latin American population groups residing in Spain were Ecuadorians, Colombians, Argentinians, Bolivians and Peruvians (in descending order) (INE 2011). This country ranking also corresponds to the Latin American 1.5 generation, which amounts to almost 550,000 individuals who migrated to Spain before reaching the age of 18. On average, this group arrived at the age of 8.8 years in Spain, and at the time of the last census in 2011, they were 17.9 years old (INE 2011).

4.2.2 Fertility behaviour at origin and destination

In general, women and men in Latin America have their first child at a relatively young age, and throughout their life course they have more children than Spaniards. The average age at first birth in the Latin American region is 21.7[2] (Bongaarts and Blanc 2015), nearly nine years

[2] The median age at first birth hovers around 21-22 in Bolivia, Colombia, Dominican Republic, Ecuador and Peru, according to *Demographic and Health Survey* data (Table 1). Only women with tertiary education display a later age at first birth, ranging from 23.8 in the Dominican Republic to 27.2 in Colombia. Nevertheless, even among Latin American women with university studies age at

earlier than in Spain (mean age of 30.6 in 2014). With regard to fertility levels, the Total Fertility Rate (TFR) was 2.1 in Colombia (2010), 2.5 in Peru (2009), 3.3 in Ecuador (2004) and 3.5 in Bolivia (2008), according to Demographic and Health Survey data (Table 1), whereas in Spain it averaged 1.32 children per woman during the 2000-2014 period. Although the average desired family size has declined to about two children in most Latin American countries (Westoff and Bankole 2002), in low educated strata, individuals tend to overachieve their desired family size, reflecting unmet need for family planning (Sedgh et al. 2016). One of the singular demographic features of Latin America is that rapid and sustained fertility decline was not accompanied by a gradual delay in the onset of childbearing (Heaton et al. 2002), as has been the norm in European countries. It is only recently that an emerging trend towards childbearing postponement has been observed among the highly educated strata (Rosero-Bixby et al. 2009). Furthermore, Latin America continues to have an adolescent fertility rate well above the level expected in light of its TFR and socio-economic indicators (Rodríguez-Vignoli and Cavenaghi 2014).

Spain is currently one of the European countries with lowest fertility. After a historic low in the late nineties (TFR of 1.15 in 1998), fertility slowly recovered up to 1.45 in 2008, but the beginning of the economic recession again led to a downward trend (Castro-Martín and Martín-García 2013). The moderate fertility recovery in the early 2000s can be explained, at least partly.

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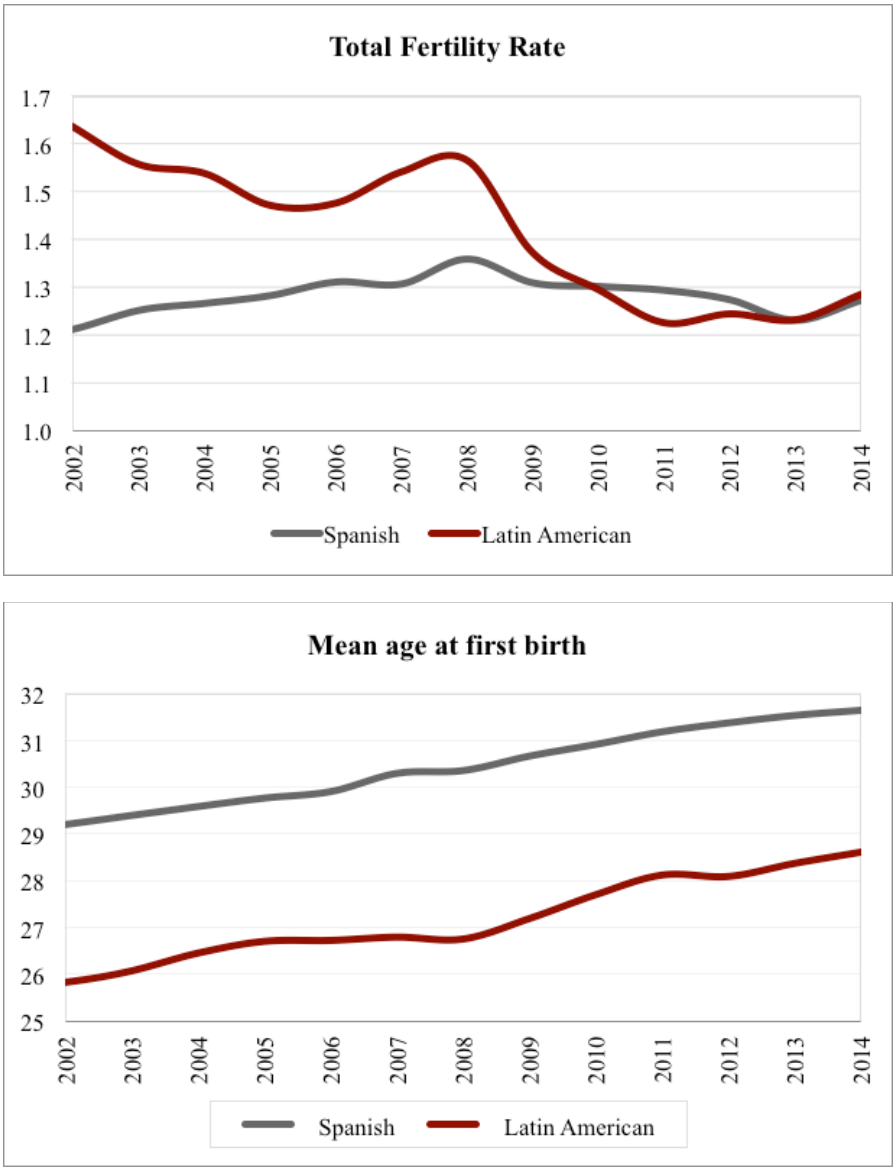
first birth is considerably earlier than among Spanish women with tertiary education (mean age of 33.6 in 2014).

Table 1. Total Fertility Rate, ideal number of children and age at first birth in selected Latin American countries, by women's age and education.

Country	Total Fertility Rate				Mean ideal number of children				Median age at first birth		
Age	*15-49*	*15-49*	*15-49*	*15-19*	*15-49*	*15-49*	*15-49*	*25-29*	*25-49*	*25-49*	*25-49*
Education		*Sec.*	*Ter.*			*Sec.*	*Ter.*			*Sec.*	*Ter.*
Bolivia	3.5	3.0	1.9	2.0	2.4	2.3	2.4	21.2	21.1	21.3	25.7
Colombia	2.1	2.3	1.4	1.9	2.2	2.1	2.0	21.4	21.6	21.4	27.2
Dom. Rep.	2.5	2.4	1.9	2.4	2.8	2.6	2.7	21.3	20.9	21.0	23.8
Ecuador	3.3	3.0	1.9	2.2	2.6	2.4	1.7	21.1	21.2	21.1	25.8
Peru	2.5	2.5	1.7	2.1	2.4	2.3	2.3	22.3	21.9	21.4	27.1

Data: *Demographic and Health Surveys* for Bolivia (2008), Colombia (2010), Dominican Republic (2013) and Peru (2007-08); *Reproductive Health Survey* for Ecuador (2004); *Note:* Sec.=Secondary education, Ter. Tertiary education.

Figure 1. Total Fertility Rate and mean age at first birth of Spanish women and Latin American women residing in Spain, 2002-2014.



Data: INE, *Population Figures* and birth microdata.

Nonetheless, the overall impact of migrant fertility on the Spanish TFR is rather modest (Castro-Martín and Rosero-Bixby 2011; Roig Vila and Castro-Martín 2007). As illustrated in Figure 1, the fertility levels of Latin American women residing in Spain have always been well below those observed in their countries of origin, a pattern that reflects the higher education composition of migrants compared to non-migrants, as well as the disruption processes associated with migration. Fertility levels among Latin American immigrants have also experienced a considerable decline over time: from 1.64 children in 2002 to 1.29 children in 2014, converging to native levels. The decline intensified from 2008 to 2011 and can presumably be linked to the economic crisis, which has been particularly severe for the immigrant population in Spain (Martínez-Molina et al. 2014).[1] However, such convergence has not been observed with regard to the fertility calendar. During the past decade, Latin American immigrants have entered motherhood, on average, about three years earlier than Spanish-born women (Figure 1). In 2014, for instance, the mean age at first birth was 28.6 years for Latin American women and 31.7 for Spaniards.

In brief, for most of the past decade, the fertility level and calendar of Latin American first-generation immigrants has occupied a space in between those recorded in origin and destination, although differences at destination between natives and immigrants have diminished over time and even disappeared in the case of period fertility levels—perhaps temporarily due to the economic crisis. In this context, the fertility preferences of the 1.5 generation are of special interest, since this group has been socialized 'in between' two cultures with distinct fertility patterns and norms.

4.1 Theoretical framework and hypotheses

4.3.1 Adolescents' fertility preferences

Originally studied in the field of social psychology, fertility preferences have found their way into demographic research. Fertility preferences encompass two interrelated but theoretically distinct concepts. Whilst

[1] In 2011, the unemployment rate among extra-EU migrants (34.6 per cent) was well above that of Spaniards (19.7 per cent). Similarly, the wage gap between immigrants and natives has also broadened with the economic crisis (Martínez-Molina et al. 2014).

fertility desires or *aspirations* refer to ideals and wishes for one's future, *fertility expectations* refer to more realistic plans that take into account possible constraints that might go beyond an individual's control (Morgan 2001). Expectations also take into consideration possible problems with or access to contraception, the perceived economic situation, and aspirations in other (competing) life domains, such as education or the labour market (Régnier-Loilier 2006). However, both concepts are highly correlated and in many studies they are used interchangeably (Miller 2011). We will examine both fertility desires and expectations, but because fertility expectations are closer to subsequent behaviour than fertility aspirations, our main focus will be on expectations.

Fertility expectations of adolescents tend to be more uncertain than those of older individuals that are already in their peak reproductive years (Berrington and Pattaro 2014; Walker 2001). Teenagers may not be able to forecast realistically future fertility outcomes, and many might see family formation as too distant in the future. Yet, adolescents' fertility preferences are still meaningful and relevant to analyse. First, some studies have shown that family building preferences are formed relatively early in the life course (Berrington and Pattaro 2014), and that fertility-related expectations are in fact "salient events" for 15- to 17-year olds (Walker 2001). Second, in our study we are not interested in the predictive power of fertility preferences, but rather in the differences between native and foreign-born adolescents. Hence, even if the fertility desires and expectations of teenagers reflect merely social and cultural norms rather than realistic personal plans, they are still of scientific relevance.

4.3.2 The impact of migrant background on fertility preferences

The aim of this section is to discuss whether the most common hypotheses used in the literature to explain the interrelationships between migration and fertility for the first generation (disruption, interrelation of events, selection, adaptation and socialization) are relevant to understand the fertility preferences of the 1.5 generation and, with this in mind, derive our hypotheses. In our hypotheses we distinguish explicitly between preferences towards age at first birth and family size, since they do not necessarily follow the same socio-psychological logic.

The disruption and interrelation of events hypotheses focus on the short-term impact of migration on family formation events. According to the *disruption* hypothesis, in the immediate time before and after migration, immigrants have low fertility levels as a result of 'disruptive factors'

(such as economic and psychological stress or separation of spouses) inherent to the migration process (Kulu 2005). The *interrelation of events* hypothesis argues that higher fertility levels shortly after migration are attributable to the coincidence of migratory and family formation processes (Andersson 2004). Both mechanisms apply to migrants of the first generation, who migrate during their reproductive phase, and thus are rather unlikely to affect the fertility preferences and behaviour of the 1.5 generation (Adserà and Ferrer 2014).

The *selection* hypothesis posits that the fertility behaviour of migrants differs from that of non-migrants at origin due to the fact that migrants are a selected group in terms of education and upward mobility aspirations (Kulu 2005; Milewski 2007). This hypothesis may apply to child migrants, although only indirectly through parental selective migration. Parents of child migrants tend to be selected on grounds of socio-economic resources, education and social mobility aspirations (Feliciano 2005); many of them migrate just because they search for a better (educational and professional) future for their children (Adserà et al. 2012). As a matter of fact, it has been documented that Latin American migrant women in Spain have higher educational levels than non-migrant women in their corresponding origin countries (Castro-Martín and Rosero-Bixby 2011). As an illustration, we compared the educational levels of Ecuadorian parents of 14- to 16-years old living in Spain and of those back home in Ecuador. Using census data from Ecuador (INEC 2010) and Spain (INE 2011), we were able to confirm positive educational selection of the fathers, and particularly the mothers, of the Ecuadorian 1.5 generation in Spain: the proportion of mothers who had completed at least secondary education was 42.3 among migrants in Spain compared to 27.4 among non-migrants in Ecuador (Table 7 in the Appendix). We should note that educational level might be a misleading proxy for socio-economic status at destination in the case of first-generation Latin American migrants, since they often take up jobs below their qualification level, with low salaries and precarious conditions (Bernardi et al. 2011). However, the positive educational selection of migrant parents is likely to influence adolescents' fertility preferences, because more highly educated parents are more likely to transmit aspirations for high educational attainment and professional occupations to their children, which compete with early family formation (De Valk and Liefbroer 2007a, 2007b; Plotnick 2007; Starrels and Holm 2000). Although controlling for selective migration, both in terms of observed and unobserved characteristics, is beyond the scope of this paper, we include in the analysis a covariate for the highest level of parental education in order to take into account its influence. We anticipate that parental education will have a positive effect on migrant adolescents'

expectations to postpone entry into parenthood, but a weak impact on their expected number of children, since family size preferences do not vary much across educational groups in Latin American societies (as shown in Table 1).

The underlying assumption of the *socialization* hypothesis is that an individual's family-related behaviour is largely shaped by the cultural values and norms internalized during childhood (Milewski 2007). According to this hypothesis, first-generation migrants tend to maintain the fertility patterns of their country of origin, and only second and subsequent generations, which are exposed during childhood and adolescence to the culture and norms of the host society, would converge to the patterns of the majority population.

Finally, the *adaptation* hypothesis assumes that the fertility preferences of migrants gradually adapt to the new economic, social and cultural environment at destination. According to this view, migrants' fertility behaviour will progressively converge to that prevailing in the host society (Lindstrom 2003). This convergence does not necessarily imply a process of acculturation, but can result from adjustment strategies to cope with the political, societal and labour-market situation in the new country (Andersson 2004).

Both socialization and adaptation mechanisms are relevant to understand the fertility preferences of the 1.5 generation, although their relative influence might be hard to disentangle. Child migrants are socialized partly at origin and partly at destination. Since they arrive before starting their reproductive life, individuals of the 1.5 generation have enough time during their childhood and adolescence to adapt to the life style and fertility norms of the destination country.

From previous research, we know that ideal ages for entering parenthood vary across origins for 1.5 and second generation immigrant youths (De Valk 2013; De Valk and Liefbroer 2007a). Migrant children coming from countries with earlier ages at first birth prefer earlier transitions to parenthood than their native counterparts. However, migrant children favour a later entry into parenthood than their parents do, indicating an adaptation process towards the norms of delayed commitment to family roles prevalent in most Western societies (De Valk and Liefbroer 2007a). In Spain, a recent study shows that the actual timing of first births of the Latin American 1.5 generation also more closely resembles the timing pattern of native Spanish women than that of the Latin American first generation (González-Ferrer, Castro-Martín, et al. 2015). These results are not totally conclusive because, given the young age profile of the Latin American 1.5 generation, they are based on the reproductive behaviour of

the older members, and patterns might change as the rest of the 1.5 generation reaches adulthood. However, they do seem to signal a relatively fast intergenerational adaptation towards the late childbearing patterns prevailing in Spain. The findings of prior research lead to our first hypothesis:

H1. Adolescents of the 1.5 generation have been socialized partly at origin and partly at destination. Therefore, their expected age at first birth should be younger than for native adolescents, but older than the actual age prevailing in the society of origin.

Age at migration and duration of stay at destination are crucial to disentangle the relative strength of socialization and adaptation influences on the 1.5 generation. A younger age at migration means more time to adapt to the socio-economic, cultural and family patterns prevalent in the host country. Moreover, a longer part of childhood and adolescence, the socialization phase, is spent at destination (Adserà and Ferrer 2014). Therefore, we hypothesize the following:

H2. Adolescents of the 1.5 generation adapt gradually to the family-related norms present at destination. Therefore, the lower their age at migration, the higher their expected age at first birth, and the narrower the gap with native adolescents.

The degree of *social integration* into the host society also conditions the pace of adaptation to the fertility norms prevailing at destination. In this context, social integration refers to the extent to which immigrants and their children interact with or are segregated from members of the host society (Nimmerfeldt et al. 2013). Several indicators can be used to measure the 1.5 generation's degree of social integration into the host society—such as maintaining friendships with natives, having native-dominated social networks, and belonging to ethnically diverse classrooms or neighbourhoods. Prior research has found that friends and social networks influence childbearing attitudes through social learning and social influence (Balbo and Barban 2014). Accordingly, foreign-born adolescents who are more socially integrated are presumed to have a stronger adherence to the fertility norms prevalent at destination. Therefore, we anticipate the following:

H3. The more socially integrated the adolescents of the 1.5 generation, the later their expected ages for having the first child and the smaller the differences with their native counterparts.

As noted earlier, parents of Latin American-born adolescents are a selected group in terms of social mobility aspirations for their children.

Prior literature has documented that immigrant families, both in the US and Europe, hold rather optimistic views about their children's educational prospects (Kao and Tienda 1998; Salikutluk 2016). In spite of worse school results, generally linked to disadvantaged socio-economic status, children of immigrants are expected to benefit from their families' high educational ambitions for them. Spain is not an exception in this regard: despite educational underperformance, children of immigrant families are largely optimistic regarding their educational expectations, although to a lesser extent than natives (Cebolla-Boado et al. 2013; Portes et al. 2010). Previous research has also shown that there is a clear link between adolescents' educational expectations and fertility timing preferences: the higher adolescents aim for their educational future, the later they prefer to enter parenthood (Plotnick 2007). Yet, it remains to be explored how educational expectations relate to fertility preferences among adolescents of the 1.5 generation in Spain. We anticipate the following:

H4a. The higher adolescents' educational expectations, the higher their expected ages for the first child.
H4b. A large part of the observed differences in fertility timing expectations between 1.5 generation and native adolescents can be attributed to their dissimilar educational expectations.

Since educational expectations are influenced by previous school performance, in the analysis we control for whether the respondent has *repeated at least one school year* during her or his school trajectory. For adolescents of migrant origin, grade retention tends to be more prevalent, since their international migration experience has a (temporary) disruptive effect on their school performance. Although Latin American students presumably enjoy an advantage over other immigrants because they already possess Spanish language abilities, prior studies have documented that they underperform natives, even after controlling for family background and school characteristics (Azzolini et al. 2012).

The previous four hypotheses focus on fertility timing preferences, which diverge considerably at origin and destination. In contrast, with regard to family size preferences, a 'two-child norm' prevails both at origin and destination and hence not much variation by migrant status can be expected. Across Europe, although many countries experience fertility levels far below replacement, the ideal family size has remained stable at around two children for the last three decades (Sobotka and Beaujouan 2014; Testa 2014). Across Latin America, the average desired family size has declined to about two children in the past decade (Westoff and Bankole 2002). Table 1 displays family size preferences for five Latin American countries for which there are recent demographic surveys

available—they also represent the top migrant sending countries to Spain. The mean ideal number of children ranges from 2.2 in Colombia to 2.8 in the Dominican Republic among women aged 15 to 49. However, among women with at least secondary education, and especially among women aged 15-19, the age range we are interested in, the mean ideal family size hovers around two children. These figures show that, while actual fertility levels are higher in Latin America than in Spain, the ideal number of children among young cohorts does not differ much in both settings. Therefore, we anticipate that adolescents of the 1.5 generation would largely conform to the two-child norm.

H5. Family size expectations of adolescents hover around two children, independent of migrant status.

4.3.3 Other sociodemographic and family-related factors influencing fertility preferences

The family is an important socializing agent and may play a key role in shaping the fertility preferences of adolescents of immigrant origin as well as of natives. In addition to *parental educational attainment,* we take into account the intergenerational transmission of fertility patterns by controlling for the *number of siblings*. Adolescents growing up in large families are more likely to prefer a larger family size and an earlier family formation than comparable adolescents with fewer siblings (Berrington and Pattaro 2014; Plotnick 2007). *Family structure* may also affect adolescents' fertility preferences. Studies on Hispanic adolescents' fertility expectations in the US arrive at the conclusion that youth living in non-traditional families are more likely to develop non-normative attitudes and expectations towards their own family formation (Trent 1994).

Religiosity has also been found to be relevant for fertility preferences of adults (Hayford and Morgan 2008; Rackin and Bachrach 2014) and adolescents (De Valk and Liefbroer 2007a). Children growing up in non-religious families are more likely to favour postponed parenthood compared to those with strong religious involvement (De Valk and Liefbroer 2007a). Using the same dataset as the present study, González-Ferrer et al. (2014) found that the more religious parents and adolescents are, the more likely are the latter to prefer earlier entry into parenthood.

Furthermore, fertility timing preferences vary by *gender*, since women are typically younger when having their first child compared to men (Fussell and Furstenberg 2005). When focusing on adolescents, it is also important

to take into consideration respondents' *age* at the time of the survey, since preferences may change in the process of social maturation.

4.2 Data and methods

4.4.1 The Chances Survey

The dataset used for the analysis is the *Chances Survey,*[2] which collected data from 2,700 adolescents aged 14 to 18 enrolled in 3rd and 4th grade of compulsory secondary education in the city of Madrid in 2011 (González-Ferrer, Kraus, et al. 2015). The school sample was selected through a two-step procedure. In the first stage, 24 neighbourhoods were selected from four different strata constructed by combining three indicators: 1) the total number of foreign-born children aged 10-16 from the ten largest immigrant groups living in Madrid, 2) the percentage of the immigrant-origin population in the neighbourhood and, 3) the socio-economic profile of the neighbourhood, according to official data provided by the City Statistical Office. The only neighbourhoods excluded from the sample design were those with less than a 9 per cent foreign-born population (13 neighbourhoods out of 133 in the city), which overall contained only 3 per cent of the total foreign-born population in Madrid.[3] The 24 selected neighbourhoods included 120 schools with secondary education. In the second stage, 30 schools (15 public schools and 15 private but state-funded schools) were randomly selected from those 120 secondary schools. With the cooperation of school principals, the survey was administered to all students—both natives and of immigrant origin—in all the 3rd and 4th grade classrooms.[4] Completely private schools, which comprise 19 per cent of all secondary schools in Madrid, were not

[2] The data collection was carried out under the framework of the *Chances Project*: "Aspirations, expectations and life-course orientations of immigrant and non-immigrant origin youth in Spain. The role of the social context and intergenerational conflict. The research project and the data collection were co-directed by Amparo González-Ferrer (CSIC) and Héctor Cebolla-Boado (UNED). http://chancesproject.es

[3] At the time of the 2011 Census, the overall share of the foreign-born population in Madrid was 17 per cent. The Latin America-born population represented 57 per cent of the total immigrant population in Madrid (INE 2011).

[4] In addition to the students' questionnaire, the parents completed a parallel questionnaire at home. However, parental response rates were low: 38.8 per cent among immigrant-origin parents and 48.5 per cent among native parents.

included in the study, because less than 5 per cent of foreign students are enrolled in them, and because most of their foreign students (73 per cent) are from EU-15 countries (Consejería de Educación y Empleo 2012). Since secondary education is compulsory in Spain, no specific group is excluded because of early school leaving.

The resulting data are a representative sample of (non-EU15) immigrant adolescents enrolled in the 3rd and 4th grades of secondary school in the municipality of Madrid, including a native control group constituted of all their Spanish classmates. Since upper-class neighbourhoods with less than 9 per cent of foreign-born population and entirely private schools were excluded from the sample design, the native sample is not representative for Spanish adolescents living in Madrid.

Our analyses are restricted to Spanish natives and Latin American migrants of the 1.5 generation. Immigrants from other countries were excluded, since sample sizes were small and fertility patterns are quite diverse in different origin regions. Adolescents of the second generation (born in Spain with one or two Latin American-born parents) were also excluded from the analytical sample because the sample size was relatively small (N=77) and our focus is on the 1.5 generation. Latin American adolescents born abroad and having mixed parents (one born in Latin America and the other one in Spain) were classified as Latin Americans (N=25).

Our final analytical sample includes 1,496 natives and 763 Latin Americans of the 1.5 generation. Table 2 shows the distribution of respondents by country and subregion. Among Latin American-born adolescents, more than half come from Ecuador (N=414), followed by Peru, Bolivia, Colombia and the Dominican Republic, roughly reflecting the actual composition of the Latin American population aged 14–17 in Madrid in 2011.

Table 2. Composition of the analytical sample by country of birth

Origin	**N**	**%**
Spanish	1,496	66.2
Ecuadorians	414	18.3
Other Andean	220	9.7
(92 Peru, 65 Bolivia, 63 Colombia)		
Rest South American	63	2.8
(14 Venezuela, 13 Brazil, 13 Paraguay, 12 Argentina, 6 Chile, 5 Uruguay)		
Central American and Caribbean	66	2.9
(53 Dominican Republic, 8 Cuba, 1 Guatemala, 1 Honduras, 1 Mexico, 1 Nicaragua, 1 Panama)		
Total	**2,259**	**100.0**

Data: *Chances Students' Survey* 2011.

4.4.2 Measures

The analysis focuses on two dependent variables, the first one referring to first child timing preferences and the second one to family size preferences. For both fertility timing and quantum, distinct questions on desires and expectations were formulated. Concerning fertility timing, students were asked: 'At what age would you like to have your first child?' (*desire*), followed by the question 'Do you really think you will have your first child at the age indicated? If not, at what age do you think you will have it?' (*expectation*). Concerning family size, students were asked: 'How many children would you like to have?' (*desire*), followed by the question: 'Do you really think that you will have the number of children indicated? If not, how many children do you think you will have?' (*expectation*).

The distributions of desired and expected age at first birth show substantial heaping on ages ending in 0 (desires=20 and expectations=22 per cent) and 5 (16 and 15 per cent), both among Spanish and Latin American adolescents (see Figure 2 in the Appendix). The level of nonresponse for expected age at first birth is slightly lower among Latin Americans (17 per cent) than among Spaniards (20 per cent), although differences are not statistically significant[5]. The relatively high level of nonresponse and age heaping possibly reflect uncertainty and ambiguity in reproductive preferences (Ní Bhrolcháin and Beaujouan 2011; Walker 2001), and strengthens the argument that fertility preferences during adolescence tend to reflect social norms rather than personal intentions.

Our main covariates to measure migrant background are the following: (a) *Origin*: Adolescents born in Latin America are defined as migrants of the 1.5 generation. The Spanish native control group comprises those individuals born in Spain to Spanish parents. The migrants were classified into four groups, based on sample size and geographic proximity (Del Rey and Grande 2015): Ecuador (the largest group in our sample), other Andean countries (Peru, Bolivia, Colombia), the rest of South America (Venezuela, Brazil, Paraguay, Argentina, Chile, Uruguay), and Central America and the Caribbean (Dominican Republic, Cuba, Guatemala, Honduras, Mexico, Nicaragua, Panama). (b) *Age at migration*: A dummy variable distinguishes adolescents who migrated at age 10 or later from

[5] Logistic regression models predicting the likelihood of a missing response in expected age at first child, and controlling for the same covariates as in the full model of Table 5, show that boys and native students are slightly more likely not to provide an answer.

the rest (those migrated before age 10 and natives)[6]. (c) *Spanish best friends*: The number of Spanish best friends is used as a proxy for social integration into the host society (Nimmerfeldt et al. 2013). A dummy variable was constructed indicating whether, among the respondent's three best friends, at least two of them had Spanish-born parents.

To take into account the mediating role of educational expectations, a dummy variable measuring the expectations of going to university, as well as a covariate for current educational performance (measured by whether the student has ever repeated a grade) are included. Furthermore, we include a variable for the highest educational level of the father or mother in order to account for parental selective migration, as well as covariates for the number of siblings, whether the adolescent is currently living with both parents, and whether the adolescent considers religion to be important (defined as 7-10 on a 0-10 scale of self-assessed importance of religion). The analyses also control for adolescents' gender and age.

4.4.3 Methods

We first present descriptive analyses of the differences between native and Latin American-born adolescents in fertility desires and expectations concerning age at first birth and number of children. We calculate means and standard deviations for migrant and native girls and boys, and test whether or not observed differences are statistically significant.

Next, ordinary least squares regression (OLS) is employed to examine fertility-timing preferences, and covariates are included in a stepwise fashion. In Model 1, only migrant background was included. In order to test the adaptation hypothesis, age at migration was incorporated in Model 2. In the next model, the number of Spanish best friends, a proxy for social integration, was added. Model 4 incorporated the variables for socio-demographic and family background. Lastly, Model 5 included adolescents' educational expectations in order to assess their mediating effect, as well as the measure for school performance. To account for the hierarchical structure of the data, standard errors were clustered on the school level (cluster option in STATA 14) across all models.

Lastly, Poisson regressions with clustered standard errors were computed to examine the desired and expected number of children (Cameron and

[6] We could not distinguish between these two groups, as this variable would be highly correlated with the measure for origin. Additional analyses focusing only on migrants showed no statistically significant differences in expected fertility timing by age at migration.

Trivedi 2009).[7] Following the same order and logic as for fertility timing preferences, five models were computed. Multivariate analyses were performed for both desired and expected age at first birth and number of children. The correlations between desires and expectations were greater than r=.85 and the substantive results of the analyses were very similar, regardless of the measure used. Therefore, we present and discuss only multivariate results based on fertility expectations, which tend to be more realistic, and the models based on fertility desires can be consulted in the Appendix (Table 8 and Table 9).

4.3 Results

4.5.1 Similarities and divergences in fertility preferences

Table 3 provides descriptive statistics for the dependent variables by origin and gender. As anticipated, Latin American boys and girls desire and expect to have their first child earlier than their Spanish counterparts. For girls, the gap in desired age at first birth between Latin Americans and Spaniards is 1.2 years, and for expected age at first birth it is 1.8 years. The observed gap for boys by origin is similar: 1.4 years for desired age at first birth and 1.8 years for expected age at first birth. These gaps are narrower than those in the actual age at first birth observed for Latin American first-generation migrants. As noted earlier, Latin American women residing in Spain enter motherhood on average three years earlier than Spaniards. The most frequent answer given by respondents was 30, both for age at first birth desires and expectations. Only the modal value for Latin American girls was 25 years (see Figure 2 in the Appendix).

In contrast, there is not much variation in the mean desired and expected number of children, which hovers around two children for both Spanish and Latin American boys and girls. Interestingly, the mean desired number of children is slightly lower among Latin American adolescents than among their Spanish counterparts, but differences are not statistically significant when distinguishing by gender. The mean expected family size is also slightly lower than the desired family size, suggesting that adolescents would like to have more children than they think is feasible. The share of adolescents who desire and expect to remain childless is larger among Latin Americans, both for boys and girls, but the differences

[7] A mutinomial logit analysis to examine the propensity to depart from the two-child norm was also performed, but substantial conclusions did not change.

do not reach statistical significance. Overall, descriptive comparisons for family size preferences support the pervasiveness of the two-child-norm anticipated in Hypothesis 5.

Table 3. Descriptive statistics for dependent variables by origin and gender

	By origin		By origin and gender			
			Girls		Boys	
	Spanish	Latin American	Spanish	Latin American	Spanish	Latin American
Desired age at first birth						
mean (years)	28.4	27.1***	27.7	26.5***	29.1	27.7***
SD	3.7	3.8	3.3	3.4	3.9	4.1
missing (%)	9.7	7.0*	7.2	5.6	12.0	8.6
Expected age at first birth						
mean (years)	28.7	26.9***	28.1	26.3***	29.3	27.5***
SD	3.7	4.0	3.5	3.7	3.9	4.2
missing (%)	19.8	17.2	19.4	17.5	20.2	16.7
Desired number of children						
mean	2.1	2.0*	2.2	2.1	2.0	1.9
SD	1.0	1.0	0.9	1.1	1.1	1.0
0	7.2	9.7*	5.1	8.0	8.9	11.6
1	10.3	10.4	6.4	10.7*	13.6	9.9
2	55.2	56.6	59.2	57.9	51.9	55.3
3	18.2	16.3	21.6	14.7**	15.3	18.0
4+	5.5	5.2	5.7	7.7	5.4	2.5*
missing (%)	3.6	1.8**	2.0	1.0	4.9	2.8
Expected number of children						
mean	1.9	1.9	2.0	1.9	1.9	1.8
SD	1.0	1.0	0.9	0.9	1.0	1.0
0	7.4	9.6	5.5	8.0	9.0	11.3
1	14.0	13.5	11.4	13.0	16.3	14.1
2	52.3	51.4	55.4	54.9	49.6	47.5
3	14.7	14.6	16.8	12.5*	13.0	16.9
4+	3.1	3.9	2.9	5.2	3.3	2.5
missing (%)	8.4	7.1	8.0	6.5	8.8	7.7
N	**1496**	**763**	**686**	**401**	**810**	**362**

Data: *Chances Students' Survey* 2011. *Note:* Asterisks indicate significant differences between Spanish and Latin American adolescents: * p<0.05, ** p<0.01, *** p<0.001; SD=Standard deviation.

Table 4. Descriptive statistics for independent variables by origin

		Spanish %	Latin American %
Migrant background			
Origin		66.2	33.8
Latin American region	*Ecuador*		54.3
	Other Andean		28.8
	Rest South America		8.3
	Central Am. & Caribbean		8.7
Age at migration to Spain	*mean (years)*		8.9
	migrated before age 10		54.7
	migrated at age 10 or later		44.0
	missing		1.3
Spanish best friends	*2 or 3*	85.0	16.6***
	0 or 1	7.7	76.2***
	missing	7.4	7.2
Socio-demographic and family background			
Highest parental education	*primary or less*	10.4	10.0
	secondary	48.0	49.8
	university	33.9	35.1
	I don't know	7.7	5.1*
Number of siblings	*2 or more*	20.6	58.3***
	0 or 1	77.9	41.0***
	missing	1.5	0.7*
Family structure	*with both parents*	80.8	64.1***
	with one or no parent	18.5	35.1***
	missing	0.8	0.8
Importance of religion	*mean (scale 0–10)*	3.4	5.6***
	SD	3.1	3.1
	important (7–10)	18.4	40.6***
	not important (0–6)	79.8	57.7***
	missing	1.8	1.7
Female		45.9	52.6**
Age at survey (mean in years)		15.2	15.6***
Educational performance and expectations			
Grade ever repeated		33.2	59.7***
University degree expected	*yes*	58.2	44.8***
	no	40.9	44.8***
	missing	0.9	1.2
	N	**1496**	**763**

Data: *Chances Students' Survey* 2011. *Note:* Asterisks indicate significant differences between Spanish and Latin American adolescents: * p<0.05, ** p<0.01, *** p<0.001; SD=Standard deviation.

Table 4 presents descriptive statistics for the independent variables. Nearly 55 per cent of Latin American adolescents in the sample migrated to Spain under age 10, and 16.6 per cent have two or more Spanish best friends. With regard to family background, there are no apparent differences in parental education, supporting the positive educational selection of Latin American immigrants in Spain. There is, however, an important difference across origins regarding the number of siblings, which reflects actual differentials in fertility levels at origin and destination. The share of Latin American adolescents with two or more siblings is almost three times as high as that of Spaniards (58.3 vs. 20.6 per cent). Latin American adolescents are also more likely to live with only one parent and they attach more importance to religion than their Spanish counterparts. At the time of the survey, Latin American students were slightly older than their Spanish counterparts (15.2 versus 15.6 years); the age difference can be explained by the larger share of Latin American students who have repeated a grade (59.7 per cent compared to 33.2 of Spaniards).[8] With regard to their educational expectations, natives on average aim higher: 58.2 per cent (versus 44.8 per cent of Latin Americans) expect to attain a University degree.

4.5.2 Fertility timing preferences

Table 5 presents the multivariate results for expected age at first birth. The OLS regression coefficients confirm that Latin American adolescents generally expect to have their first child earlier than their Spanish classmates, even after controlling for compositional differences. This holds true for Ecuadorians and other Andeans, the main origin groups. For all groups, the effect of origin attenuates when introducing the control variables, and particularly after controlling for social integration in Model 3. For Central Americans/Caribbeans, the effect of origin is no longer statistically significant after controlling for educational expectations (Model 5). Only the 'Rest of South America' category does not show any significant difference to natives before controls, which can be presumably attributed to the fact that South Cone countries like Argentina, Chile or Uruguay have already started the postponement phase of the Second Demographic Transition (Nathan et al. 2016). Hypothesis 1, in which we hypothesized that adolescents of the 1.5 generation would prefer to have their first child earlier than comparable Spaniards, can therefore be

[8] These numbers are relatively close to those recorded at the national level. According to PISA-2012, the percentage of immigrant students that have repeated at least a year of school before the age of 15 (54.9 per cent) is much higher than among native students (30 per cent) (Calero and Escardíbul 2016).

confirmed for the largest Latin American groups. Latin American adolescents' timing preferences for entry into parenthood reflect the influence of early socialization in origin but also adaptation, since their expected age at first birth is considerably later than that prevailing in their country of origin.

In contrast to what we anticipated, age at migration does not have any effect on the expected age at first child. According to Table 5, those who arrived in Spain at the age of 10 or older are not significantly different in their fertility timing expectations from those who migrated at younger ages. Other age cut points were also tested, but the results were not affected. The gap in fertility timing preferences between Latin American adolescents and their native classmates does not seem to narrow with increasing duration of stay at destination, and since these findings are not consistent with the presumption of a gradual adaptation process, Hypothesis 2 must be rejected.

Having two or three Spaniards among respondents' three best friends is associated with a higher expected age at first child. Consequently, Hypothesis 3 on the effect of social integration can be confirmed: more socially integrated adolescents of the 1.5 generation have fertility timing expectations that are closer to their native counterparts. Apparently, social integration is more important for the adaptation of adolescent migrants' fertility preferences than the actual age at migration.

The rest of the covariates show effects in the expected direction, although they do not always reach statistical significance. With regard to family context, adolescents with parents who have only primary or less education expect to have their first child earlier and adolescents with university-educated parents expect a delayed entry into parenthood. However, this last effect becomes insignificant when controlling for educational performance and expectations in Model 5. Having two or more siblings is associated with an earlier expected age at first birth, but it is only significant before controlling for educational performance and expectations. Neither family structure nor the importance that adolescents attach to religion appear to have a significant influence on adolescents' expected age at first birth. Mirroring actual fertility patterns, girls expect to have their first child earlier than boys, but there are no significant differences by respondent's age.

Table 5. OLS-regression models for *expected* age at first child for Spanish and Latin American adolescents

		(1)	(2)	(3)	(4)	(5)
Migrant background						
Origin	Ecuador	-2.16***	-2.11***	-1.38***	-1.23**	-1.13**
(Ref: natives)		(0.32)	(0.33)	(0.38)	(0.41)	(0.41)
	Other Andean	-1.73***	-1.66***	-0.98*	-1.10*	-1.08*
		(0.36)	(0.40)	(0.47)	(0.46)	(0.45)
	Rest South America	-0.21	-0.11	0.42	0.37	0.18
		(0.40)	(0.39)	(0.41)	(0.38)	(0.42)
	Central Am.+Caribbean	-2.29***	-2.22***	-1.48*	-1.27*	-1.21
		(0.52)	(0.57)	(0.56)	(0.61)	(0.61)
Migrated at age 10 or later			-0.16	-0.04	0.26	0.24
(Ref: before 10 or native)			(0.28)	(0.26)	(0.27)	(0.27)
Spanish best friends	2 or 3			1.08***	0.81**	0.67**
(Ref: 0 or 1)				(0.23)	(0.22)	(0.22)
Socio-demographic and family background						
Parental highest education	primary or less				-0.64**	-0.51*
(Ref: Secondary)					(0.23)	(0.20)
	university				0.43*	0.23
					(0.21)	(0.19)
Number of siblings	2+ siblings				-0.55*	-0.49
(Ref: 0 or 1 sibling)					(0.25)	(0.25)

Living with both parents	both				0.32	0.25
(Ref: with one or no parent)					(0.22)	(0.23)
Importance of religion	important				-0.02	-0.11
(Ref: not important)					(0.18)	(0.18)
Gender	female				-1.18***	-1.26***
(Ref: male)					(0.24)	(0.24)
Age					-0.11	0.16
					(0.09)	(0.13)
Educational performance and expectations						
Grade ever repeated	yes					-0.52
(Ref: no)						(0.31)
Expects to go to university	yes					0.92***
(Ref: expects lower degree)						(0.22)
Constant		28.74***	28.74***	27.78***	30.02***	25.81***
		(0.18)	(0.18)	(0.27)	(1.35)	(1.95)
N		1696	1696	1696	1696	1696
R^2		0.06	0.06	0.07	0.10	0.12

Data: *Chances Students' Survey* 2011. *Note:* * p<0.05, ** p<0.01, *** p<0.001; standard errors in parentheses. Missing values in the independent variables are included as a separate category in the models but coefficients are not presented.

Finally, turning to educational performance and expectations (Model 5), we find that the higher adolescents' educational expectations, the more they expect to delay their first child. Adolescents who think they will reach university expect to have their first child significantly later than those who expect to have a lower degree, supporting Hypothesis 4a. However, educational expectations do not seem to have a mediating effect on the relationship between migrant background and age at first birth preferences, since coefficients remain virtually unaffected when this covariate is controlled for. Therefore, Hypothesis 4b, which posited that a large part of the observed differences in fertility timing preferences between migrant and native adolescents could be explained by their dissimilar educational expectations, is not supported by the data.

4.5.3 Family size preferences

Table 6 presents the Poisson regression results for adolescents' expected number of children. Overall, Latin American adolescents' family size expectations are not significantly different from their Spanish counterparts. The only exception is adolescents born in Central America or the Caribbean, whose expected family size is slightly above that of Spaniards. However, once family context is controlled for, coefficients lose statistical significance. According to the models, age at migration and the proxy for social integration (number of Spanish best friends) do not exert a significant influence on family size preferences.

The covariates that have a significant impact on expected family size are not identical to those influencing expected age at first birth. The expected number of children is higher for girls than for boys, and also higher among adolescents brought up in larger families, in line with the findings of previous studies (Régnier-Loilier 2006). However, although religiosity had no significant influence on expected fertility timing, it has a positive impact on expected family size. Conversely, higher educational expectations favoured delayed entry into parenthood, but they do not have an apparent effect on expected family size.

All in all, the results are in line with Hypothesis 5: family size expectations do not differ by adolescents' migrant background, since in both the origin society and the destination society the two-child norm is dominant among younger cohorts, even though actual fertility levels are notably higher in Latin America than in Spain.

Table 6. Poisson regression models for *expected* number of children for Spanish and Latin American adolescents (incidence rate ratios)

		(1)	(2)	(3)	(4)	(5)
Migrant background						
Origin	*Ecuador*	0.98	0.99	0.99	0.93	0.93
(Ref: natives)		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
	Other Andean	0.97	0.99	0.98	0.93	0.93
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
	Rest South America	0.95	0.98	0.97	0.92	0.92
		(0.07)	(0.08)	(0.08)	(0.08)	(0.08)
	Central Am.+Caribbean	1.16	1.19*	1.19*	1.09	1.09
		(0.09)	(0.10)	(0.10)	(0.10)	(0.10)
Migrated at age 10 or later			0.96	0.96	0.95	0.95
(Ref: before 10 or native)			(0.04)	(0.04)	(0.04)	(0.04)
Spanish best friends	*2 or 3*			0.99	1.00	0.99
(Ref: 0 or 1)				(0.04)	(0.03)	(0.03)
Socio-demographic and family background						
Parental highest education	*Primary or less*				1.04	1.05
(Ref: Secondary)					(0.04)	(0.04)
	University				1.05*	1.05
					(0.02)	(0.02)
Number of siblings	*2+ siblings*				1.14***	1.14***
(Ref: 0 or 1 sibling)					(0.03)	(0.03)

Living with both parents	*both*				1.05	1.05
(Ref: with one or no parent)					(0.03)	(0.03)
Importance of religion	*important*				1.10**	1.10**
(Ref: not important)					(0.03)	(0.03)
Gender	*female*				1.08**	1.08**
(Ref: male)					(0.03)	(0.03)
Age					1.01	1.03
					(0.01)	(0.02)
Educational performance and expectations						
Grade ever repeated	*yes*					0.95
(Ref: no)						(0.04)
Expects to go to university	*yes*					1.01
(Ref: expects lower degree)						(0.03)
Constant		1.93***	1.93***	1.95***	1.42	1.14
		(0.03)	(0.03)	(0.06)	(0.26)	(0.25)
N		2079	2079	2079	2079	2079
Log pseudo likelihood		-3023.00	-3022.20	-3021.90	-3006.40	-3005.43

Source: *Chances Students' Survey* 2011. * p<0.05, ** p<0.01, *** p<0.001; standard errors in parentheses. Missing values in the independent variables are included as a separate category in the models but coefficients are not presented.

4.1 Summary and discussion

This study has explored the childbearing preferences of the Latin American 1.5 generation coming of age in Spain, a country which is a latecomer to mass immigration, and which is characterized by lowest-low and latest-late fertility patterns. The adolescents of the 1.5 generation are classic in-betweeners: they were born in the origin country and are being raised in immigrant families, but are attending school and reaching adulthood in the host society. We have examined to what extent their expected age at first birth and family size differ from those of native adolescents. One of our objectives was to assess whether the socialization and adaptation hypotheses, originally developed to study the fertility behaviour of first-generation immigrants, could be extended to the analysis of the 1.5 generation's childbearing preferences. Our results suggest that, as regards fertility timing, both socialization and adaptation processes are at work. Latin American-born adolescents have been exposed to the age norms for family transitions in their home country, and this early socialization might explain why they expect to have their first birth at a relatively younger age than their native peers. At the same time, their expected age at first birth is considerably older than that prevailing in the origin society, suggesting a relatively fast process of adaptation—which encompasses both girls and boys—to the late family formation norms prevailing in Spain. The extent to which adaptation reflects an adherence to new cultural norms or a response to the socio-economic conditions in the host society remains an open question, although both processes probably reinforce each other. Some of the reasons why Latin American-born adolescents readily embrace the late fertility norms of mainstream society might be that, like their native peers, they anticipate a late entry into the labour market—given the high rate of youth unemployment (46.1 per cent in 2011)—and that they are well aware of the unfavourable childbearing conditions prevailing in Spain (Castro-Martín and Martín-García 2013).

In contrast to other studies that have examined the fertility adaptation of child migrants (Adserà and Ferrer 2014), we found no support for a process of gradual adaptation: adolescents who migrated at older ages have similar childbearing preferences to those who migrated at younger ages. However, our results confirm that social integration into the host society—measured by number of native best friends—reduces the gap in expected age at first birth between migrant and native adolescents. In other words, while duration of stay at destination apparently has no

impact on adolescents' preferences, the composition of their peer group does. The less segregated teenagers of the 1.5 generation grow up, the more their family formation preferences resemble those of the native population. It could well be that, because of their immersion in the educational system, the process of adaptation of the 1.5 generation is far more rapid than that of the first generation. The lack of language barriers in the case of Latin American migrants probably also speeds up the process of integration.

Apart from social integration, the values transmitted from parents to children are also likely to be part of the explanation of why Latin American adolescents prefer to initiate childbearing at older ages than those prevailing in their origin countries. Additional analyses based on the parental questionnaire (available upon request) reveal that Latin American parents, regardless of their own educational level, favour delayed commitment to family roles for their daughters and sons, prioritizing educational and professional careers leading to upward social mobility. Hence, the selectivity of migrant parents in terms of ambitions for their children's future is likely to reinforce adolescents' inclinations to postpone family formation.

The importance of educational aspirations in shaping fertility-timing preferences is confirmed in the models. Higher educational expectations are associated with preferences for postponed entry into parenthood. However, the fact that Latin American adolescents are less likely to envision themselves going to the university than their Spanish peers does not account for the observed gap in expected age at first birth.

With regard to family size preferences, we find no significant differences between Latin American-born and native adolescents. The two-child norm seems predominant among all adolescents, regardless of migrant background. This similarity in family size preferences cannot be readily interpreted as a sign of adaptation to host society norms, since the preferred number of children among young cohorts in the societies of origin also hovers around two, even though actual fertility levels are higher. In Spain, access to contraception is widespread, but we cannot rule out that younger ages at first birth among Latin Americans may eventually lead to higher fertility than initially anticipated, due to changing preferences over the family life course or to unplanned pregnancy.[1] Although no differences regarding the expected number of

[1] The relatively high rates of abortion among Latin American women residing in Spain suggest a high incidence of unwanted pregnancy. According to data from the Ministry of Health, 24 per cent of all induced abortions in Spain during 2014 were to Latin American women.

children between Latin American and native adolescents could be found, it is important to examine and report family size preferences of immigrants in order to challenge the widespread—but unfounded—belief in Spanish society that Latin American immigrants desire and have much larger families compared to Spaniards, and that their descendants will too.

Although this study provides valuable insights into the fertility preferences of the 1.5 generation, several limitations need to be acknowledged. Firstly, the respondents are relatively young, and thus their capacity to articulate their childbearing expectations might be limited. Their responses are likely to reflect internalized social norms and broad attitudes towards family rather than personal plans. A second limitation is closely related to the first one: namely, that we are analysing fertility preferences at an early age and these preferences are not stable over the life course, but contingent on future partnership, educational and occupational paths. However, several studies using longitudinal data have found that fertility preferences measured during adolescence or early adulthood serve as valid predictors for actual outcomes in the future (Barber 2001; Miller et al. 2010; Morgan and Rackin 2010). A third shortcoming is that the survey is not nationally representative, since adolescents were sampled in only one city. Lastly, although (parental) selective migration is probably crucial in shaping fertility preferences of adolescent child migrants, the data used do not allow to account appropriately for this issue.

These limitations notwithstanding, this study provides relevant insights into the socialization and adaptation processes underlying fertility preferences of child migrants, which occupy a socio-cultural middle ground between their country of origin and destination. Even though preferences are imperfect proxies for future behaviour, our findings suggest that the future fertility trajectories of the Latin American 1.5 generation—and possibly those of the Latin American second generation—will be characterized by a somewhat younger fertility calendar but no larger family sizes than their native peers.

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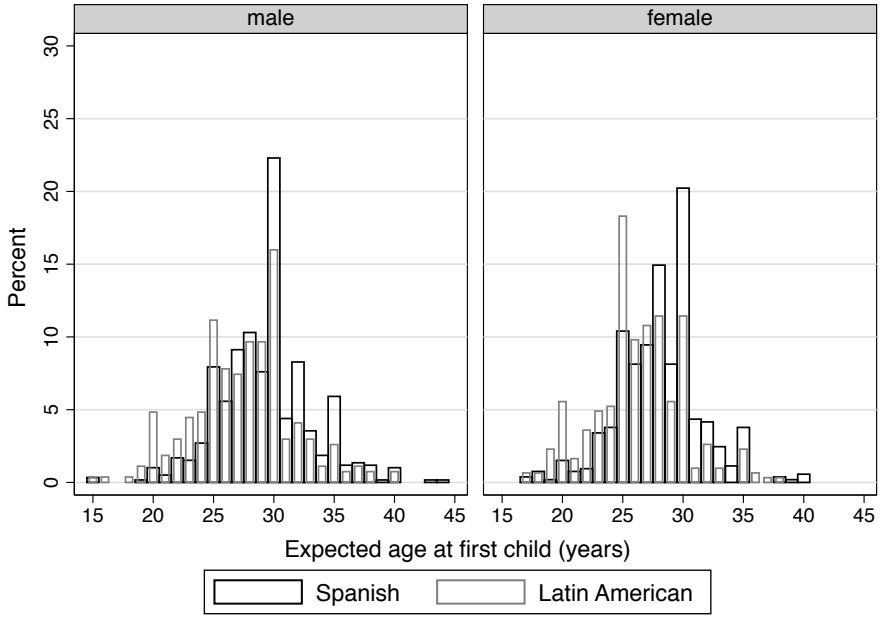
Appendix

Figure 2. Distribution of expected age at first child by origin and gender.



Data: *Chances Students' Survey* 2011.

Table 7. Parental education of Ecuadorian adolescents aged 14–16 living in Ecuador and in Spain at the time of the last census

	Father				Mother			
Residing in…	**Ecuador**			**Spain**	**Ecuador**			**Spain**
	Rural	Urban	Total	Total	Rural	Urban	Total	Total
Less than primary	27.3	11.3	17.7	19.4	36.3	15.7	23.9	23.9
Primary completed	41.7	31	35.3	23.1	45	39.2	41.5	28
Secondary completed	8.8	22.5	17	22.4	9.8	29.5	21.6	35.5
University completed	2.2	8.5	6	5.1	1.9	8.5	5.8	6.8
Unknown/Missing	1.6	0.8	1.1	--	2	1	1.4	--
Not present in household	18.4	25.9	22.9	30	5	6.2	5.7	5.8

Data: *Census Ecuador* 2010 (INEC, 2010) and *Census Spain* 2011 (INE, 2011)

Table 8. OLS-regression models for *desired* age at first child for Spanish and Latin American adolescents.

		(1)	(2)	(3)	(4)	(5)
Migrant background						
Origin	Ecuador	-1.57***	-1.57***	-0.90**	-0.67*	-0.57
(Ref: natives)		(0.24)	(0.23)	(0.28)	(0.30)	(0.30)
	Other Andean	-1.09**	-1.09**	-0.45	-0.48	-0.44
		(0.31)	(0.33)	(0.38)	(0.37)	(0.36)
	Rest South America	0.06	0.05	0.56	0.64	0.55
		(0.52)	(0.51)	(0.53)	(0.49)	(0.53)
	Central Am.+Caribbean	-2.40***	-2.46***	-1.80**	-1.45**	-1.39**
		(0.49)	(0.49)	(0.52)	(0.51)	(0.50)
Migrated at age 10 or later			-0.04	0.06	0.36	0.32
(Ref: before or native)			(0.23)	(0.21)	(0.21)	(0.22)
Spanish best friends	2 or 3			0.99***	0.66**	0.56*
(Ref: 0 or 1)				(0.20)	(0.21)	(0.20)
Socio-demographic and family background						
Parental highest education	primary or less				-0.24	-0.14
(Ref: Secondary)					(0.26)	(0.24)
	university				0.56**	0.37*
					(0.19)	(0.18)
Number of siblings	2+ siblings				-0.63*	-0.56*
(Ref: 0 or 1 sibling)					(0.25)	(0.25)

Living with both parents	both				0.29	0.20
(Ref: with one or no parent)					(0.19)	(0.20)
Importance of religion	important				-0.45**	-0.52**
(Ref: not important)					(0.16)	(0.16)
Gender	female				-1.26***	-1.34***
(Ref: male)					(0.22)	(0.21)
Age					-0.17	0.10
					(0.09)	(0.13)
Educational performance and expectations						
Grade ever repeated	yes					-0.60*
(Ref: no)						(0.28)
Expects to go to university	yes					0.73***
(Ref: expects lower degree)						(0.17)
Constant		28.42***	28.42***	27.52***	30.88***	26.76***
		(0.18)	(0.18)	(0.23)	(1.27)	(1.99)
N		1913	1913	1913	1913	1913
R^2		0.04	0.04	0.05	0.10	0.11

Data: *Chances Students' Survey* 2011. *Note:* * p<0.05, ** p<0.01, *** p<0.001; standard errors in parentheses. Missing values in the independent variables are included as a separate category in the models but coefficients are not presented.

Table 9. Poisson regression models for *desired* number of children for Spanish and Latin American adolescents (incidence rate ratios)

		(1)	(2)	(3)	(4)	(5)
Migrant background						
Origin	Ecuador	0.94*	0.96	0.96	0.89**	0.90**
(Ref: natives)		(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
	Other Andean	0.96	0.99	0.99	0.93	0.93
		(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
	Rest South America	0.94	0.99	0.98	0.92	0.92
		(0.07)	(0.08)	(0.08)	(0.08)	(0.08)
	Central Am.+Caribbean	1.12	1.17	1.16	1.05	1.05
		(0.09)	(0.11)	(0.10)	(0.10)	(0.10)
Migrated at age 10 or later			0.94	0.94	0.92*	0.92*
(Ref: before or native)			(0.03)	(0.03)	(0.03)	(0.03)
Spanish best friends	2 or 3			0.99	1.00	1.00
(Ref: 1 or 1)				(0.04)	(0.03)	(0.03)
Socio-demographic and family background						
Parental highest education	primary or less				1.05	1.05
(Ref: Secondary)					(0.05)	(0.05)
	university				1.06*	1.06*
					(0.03)	(0.02)
Number of siblings	2+ siblings				1.12***	1.12***
(Ref: 0 or 1 sibling)					(0.03)	(0.03)

Living with both parents	both				1.02	1.02
(Ref: with one or no parent)					(0.03)	(0.03)
Importance of religion	important				1.13***	1.13***
(Ref: not important)					(0.03)	(0.03)
Gender	female				1.10***	1.10***
(Ref: male)					(0.03)	(0.03)
Age					1.02*	1.04*
					(0.01)	(0.02)
Educational performance and expectations						
Grade ever repeated	yes					0.95
(Ref: no)						(0.04)
Expects to go to university	yes					1.00
(Ref: expects lower degree)						(0.03)
Constant		2.08***	2.08***	2.10***	1.35	1.10
		(0.03)	(0.03)	(0.07)	(0.22)	(0.24)
N		2191	2191	2191	2191	2191
Log pseudo likelihood		-3223.86	-3222.51	-3221.81	-3200.28	-3199.18

Data: Chances Students' Survey 2011. *Note:* * p<0.05, ** p<0.01, *** p<0.001; standard errors in parentheses. Missing values in the independent variables are included as a separate category in the models but coefficients are not presented.

CHAPTER 5:

General conclusions

This dissertation explored the relationship between two demographic phenomena—migration and fertility—by focussing on several aspects of the link between the two across the different empirical chapters. The two major aims of this thesis laid out in the introduction (Chapter 1) were, firstly, to examine fertility behaviour from a life course and a couples perspective by focusing explicitly on both men and women's migration experiences and the whereabouts of both partners. And secondly, to analyse fertility convergence (or the lack thereof) among the descendants of immigrants and the native population.

I pursued these objectives by addressing three main theoretically and empirically relevant research questions. Firstly, I examined family formation trajectories of male and female migrants before and after migration. Secondly, I explored migrant selection processes by comparing fertility timing and quantum of migrant and non-migrant couples. Thirdly, I investigated whether adolescents' fertility expectations differ according to migrant status. The findings contribute to our understanding of the interplay between migration and fertility and provide theoretical and methodological implications for the study of migrant fertility.

This final section summarizes the main findings of each empirical chapter, acknowledges several limitations, and proposes possible avenues for future research. I conclude by highlighting the main methodological and theoretical contributions.

5.1 Summary of the main findings

The empirical part consists of a compilation of three independent research papers presented in Chapters 2 to 4 in this dissertation. Each of the three chapters analyses the link between family formation patterns (or preferences) and migration from a different perspective. The analyses utilize two different datasets, different analytical approaches and distinct quantitative methods. The first two papers focus on actual family formation and fertility behaviour of Sub-Saharan African migrants to Europe; the last paper examines fertility preferences of adolescent Latin American child migrants in Spain. This section summarizes the main findings of each of the chapters.

Chapter 2, "Family life trajectories across borders. A sequence analysis approach to Senegalese migrants in Europe", analyses family formation trajectories of Senegalese migrants before and after migration to Europe, using the MAFE data. Based on the disruption and interrelation of events hypotheses, I identified three strategies for how family formation may evolve during the time before and after migration, according to the sex of the migrant. Applying sequence analysis techniques, I constructed sequences for each individual, accounting for relationship status and the timing and number of births. Using the Optimal Matching algorithm, five clusters could be identified for men and women, respectively. These cluster solutions show important variations by sex and are largely in line with the proposed strategies. For men, about half of the sample are single and childless when they migrate, and family formation begins only slowly and several years after the migration move. The other half are in a relationship when they migrate, and have none, one, two, or three or more children, depending on the cluster they belong to. The distribution plots show that men begin their relationships and have children in the years preceding migration, while after the migration move a disruption in union formation and childbearing can be observed. Apparently, partners are geographically separated in the years following migration, which is in line with previous studies on Senegalese reunification practices, which found that transnational family arrangements may be long lasting (Baizán et al. 2014). For women, family trajectories in the time preceding and following migration are more diverse. In contrast to men, the single trajectory is followed only by a small group of female migrants (15 per cent), as female independent migration is rather uncommon among the Senegalese (Toma and Vause 2013). Most of the other women are in a relationship when they migrate and it can be assumed that they follow their husbands to Europe. Some of them enter the union in the same year of migration, an indication that marriage migration is not uncommon. Another female trajectory identifies women who began a relationship some years before

migration—possibly at a distance—and have a very fast transition to a first child once they are at destination. For these two female trajectories, family life—union formation or childbearing—seems strongly interrelated with the migration move. Other women have family trajectories in more advanced stages, as most of them already have three or more children at the beginning of the observed period. These women presumably join their husbands in Europe at an older age, after having achieved their reproductive goals, and thus family formation does not seem to be interrelated with their migration move. Finally, a unique female trajectory that I did not find for men is single mothers. These women become single in the years prior to migration. Marital instability in the context of international migration has also been found in other migratory settings, especially for women. Finally, logistic regression analysis indicates that age, destination country and work experience (especially for women) are important factors related to different family trajectories in the context of international migration.

Chapter 3, with the title "Fertility behaviour of migrants and non-migrants from a couples perspective: The case of Senegalese migration to Europe", studies fertility timing and quantum of migrant and non-migrant couples. In this chapter I attempted to unravel migrant selection processes that may differentially influence the fertility behaviour of migrant couples as compared to non-migrant couples. Since selection effects are difficult to measure—especially selection on unobservable characteristics—, the empirical analysis takes into account short-term interactions between migration and fertility (disruption, interrelation of events), adaptation processes towards lower fertility levels and higher costs of childbearing and childrearing at destination, as well as selectivity on observable characteristics (education). The analyses provide evidence of lower birth risks of migrant couples mainly related to male out-migration and ensuing couple separation. In other words, fertility is disrupted following the migration of the men. But completed fertility is also affected, since Senegalese migrant couples do not adjust or compensate for the lost reproductive time, which contradicts previous findings on other migratory settings (Agadjanian et al. 2011; Chattopadhyay et al. 2006; Lindstrom and Giorguli-Saucedo 2002). Apparently, the long geographic distance and restrictive immigration policies of the destination governments make circular migration strategies more difficult. I also found support for the interrelation of events hypothesis, as first birth risks are increased in the first two years following the migration move of the woman and (re-)unification with her husband at destination. Additionally, adaptation towards lower fertility levels and higher costs of childbearing and childrearing in European destination countries could be observed. The longer couples reside together at destination, the larger the difference in

completed fertility compared to non-migrant couples. However, the differences between distinct durations of stay at destination are statistically insignificant. With regards to migrant selection, the findings show that migrant couples are positively selected in terms of education, which may also explain, at least in part, their lower fertility. Migrant selection processes on unobservable characteristics are also likely to contribute to lower total fertility of migrant couples, although with these analyses I was not able to adequately capture them. I employed a measure for whether migrant couples intended to stay temporarily or permanently at destination, based on the assumption that migrants intending a permanent settlement in Europe are selected on lower-than-average fertility compared to migrants who intend to return as well as non-migrant couples. Although the results show that temporary migrant couples are more similar to non-migrant couples, with a slightly higher number of children than couples with the intention to stay permanently at destination, the difference between both does not reach statistical significance. It can be assumed that the remaining unexplained difference in completed fertility between migrant and non-migrant couples is the result of selection processes of migrant couples on unobservable—and in fact immeasurable—characteristics that influence both the decision to migrate and migrants' fertility preferences.

Chapter 4, titled "Does migrant background matter for adolescents' fertility preferences? The Latin American 1.5 generation in Spain" (co-authored with Teresa Castro-Martín), examines fertility preferences of Latin American adolescents of the 1.5 generation and their native peers in Spain. The 1.5 generation is an interesting case, since they were born in the origin country and are being raised in immigrant families, but are attending school and reaching adulthood in the host society. Hence, the fertility preferences of this group are likely to reflect the family values of two different socialization environments as well as the adaptation process to the childbearing norms of the host society. Using a unique dataset on adolescents of different origins, we compare their preferred ages for having a first child as well as their preferred family size. The regression results for the expected age of having the first child indicate that adolescents of Latin American origin expect to have their first child slightly but significantly earlier compared to their native Spanish counterparts, reflecting socialization influences from their origin society. However, since the fertility timing expectations are also later than the actual age patterns prevailing at their origin country, a relatively quick adaptation towards family norms of the host society can be assumed. Therefore, with regards to fertility timing, the Latin American 1.5 generation occupies a "sociocultural middle ground" (Holland and De Valk 2013) between origin and destination countries. Furthermore, our

analyses reveal that the degree of social integration, proxied by the number of the respondent's best friends who were Spanish, seems more important than age at migration for diminishing the gap between Latin Americans and Spaniards. Moreover, the models confirm that adolescents with higher educational expectations—who expect to go to university—prefer a postponed entry into parenthood. With regard to family size preferences, we find no significant variations across origins, confirming the argument that the 'two-child norm' prevails in both middle-income and high-income countries.

5.2 Limitations and avenues for future research

As in most empirical research, the studies performed in the framework of this dissertation have their weaknesses, mainly related to the data and the statistical strategies. Most of these limitations were presented in detail in the concluding sections of each empirical chapter. This section will once again summarize the most important ones and highlight possible avenues for future research. Some limitations apply to several chapters or datasets, while others are specific to only one chapter/dataset.

A first limitation is related to the sample sizes of both datasets. Although the MAFE data and the *Chances Survey* offered unique opportunities to study fertility (preferences) of (child) migrants and to compare them to non-migrants at origin or natives at destination, respectively, the number of interviewed persons is relatively small. In Chapter 2, for example, the already small sample size of current migrants of the MAFE data had to be reduced even more to perform the sequence analysis. In Chapter 4, several Latin American origin countries also had to be grouped into regional categories, as only few respondents of these countries were sampled. Furthermore, the relatively small samples made it sometimes impossible to carry out a more in-depth analysis, including separate analyses by adolescent gender in Chapter 4 or a detailed breakdown by destination country in Chapters 2 and 3. This limitation should be kept in mind and the results must be interpreted with caution.

A second limitation of the MAFE data is that 'Europe' is treated as one destination, without accounting for contextual characteristics that vary across the three destination countries (Spain, France and Italy) and also within each country over time. This certainly may hide a lot of within- and between-country variation. It can be expected that Senegalese migration to France, as the former colonial power, is different than to the other two newer destination countries. For instance, France conceded

special bilateral agreements regarding the conditions for entry and stay of Senegalese migrants (Mezger and González-Ferrer 2013). Recent projects aiming at collecting and creating databases of quantitative indicators of immigration policies and their changes over time of different European countries, could be a way to account for some of these differences in immigration policies (Mezger and González-Ferrer 2013). Furthermore, both countries share the same language; French is the official language of formal education in Senegal; and the educational system follows the one in France (Beauchemin et al. 2014). These shared characteristics should facilitate a quicker socioeconomic and labour market integration of Senegalese migrants in France compared to those in Spain and Italy. Particularly for the study of fertility adaptation, aside from the differences in fertility levels (i.e. higher TFR in France than in Spain and Italy), the different labour markets, social welfare benefits, and different struggles and possibilities for the successful integration of immigrants, may condition the pace and level of fertility adaptation. Investigating the effect that different receiving contexts may have on the fertility behaviour of the same migrant group is a relevant issue for further research.

A third limitation of Chapters 2 and 3 is the practice of polygamy in the Senegalese society and its impact on migration and fertility patterns, which may also have certain implications for the attained results. Both chapters mention and to some extent control for polygamous unions or the presence of co-wives, but this issue is not examined in detail, as it goes beyond the scope of these two empirical chapters. However, it would be interesting and scientifically relevant to study which of the wives, in cases in which there are several, follows her husband to Europe, as well as the reasons for this choice. Moreover, (return) migrants tend to be financially better off compared to non-migrants and thus are in a better position to marry additional and often much younger women, leading to increased life time fertility for these men (Agadjanian et al. 2011). However, as of now there is little quantitative research on the link between polygamy, fertility and international migration. The examination of this relationship—in general and, more specifically, in Senegal—is something I leave for future research

A fourth limitation concerns the *Chances* data. One should bear in mind that the respondents of this survey are relatively young (ages 14 to 16), and their fertility preferences may be more uncertain compared to adults already in their reproductive phase. Teenagers may not be able to realistically forecast future fertility outcomes, and many might not be sexually active yet. Their responses probably reflect social and cultural norms rather than realistic personal plans. Moreover, these preferences are likely to change over the life course of an individual. This is also reflected in the large share of adolescents who did not give an answer to the

fertility-related questions. However, as we found statistically significant differences between Latin American and Spanish youths, and most are in line with our hypotheses, fertility preferences of adolescents may still serve as a valid measure for cultural differences between groups, especially if the individuals belonging to these groups have not reached their reproductive phase yet. Furthermore, as outlined in the Introduction (Chapter 1), there is very little research on family life preferences of the children of immigrants in European destination countries, and the study in Chapter 4 is one step towards filling this gap.

A final limitation regards the representativeness of the obtained results. In the framework of the MAFE survey, for example, non-migrants in Senegal were interviewed only in the capital city of Dakar, while current migrants surveyed in Europe originated from all over Senegal. In Senegal, as in most developing countries, marriage and fertility patterns vary considerably between urban and rural areas. Therefore, it may be questionable to what extent non-migrants from Dakar and migrants from all of Senegal can be compared. This is especially true when we consider that migrants in Europe have not been randomly selected in all the destination countries (only in Spain). The *Chances Survey* is also not nationally representative, as adolescents were interviewed only in the municipality of Madrid. It is not clear whether Latin American adolescents residing in other Spanish cities, or in other European destination countries, have similar aspirations and expectations for their future family life to those residing in Madrid. But the concern is not only if the obtained findings are representative for the cases studied, but also in how far they can be extrapolated to other migration settings; in other words, their generalizability. In future research it would be interesting to apply the hypotheses presented throughout the thesis to other migratory flows in order to deepen our understanding of the research questions presented here. With regard to the MAFE data, a first step could be to compare the Senegalese case with the other two origin countries covered by this project, namely the Democratic Republic of Congo and Ghana, and the respective major destination countries in Europe.

5.3 Scientific contributions

Despite these limitations, this dissertation contributes in several ways to existing literature on migration and fertility. In the Introduction of the thesis (Chapter 1), I identified several gaps in current research on migrant fertility. In this concluding section, I come back to some of these points to

emphasize how this dissertation attempts to fill these gaps, distinguishing between methodological and theoretical contributions.

5.3.1 Methodological contributions

Many studies on migration and fertility focus on women only. However, it seems crucial to also take into consideration the whereabouts of the male partner, the father of the respective children, particularly to study the effect of the separation of spouses or adaptation processes on fertility outcomes. In Chapter 3, I scrutinized the effects of the location of both partners on ensuing fertility timing and completed fertility. Taking the couple as the unit of analysis and taking into consideration both partners' time-varying migratory status permitted me to examine the timing of births dependent on both parents' location. The findings show that male migration processes also influence fertility timing and competed fertility. For instance, the analysis shows very low birth risks during periods of couple separation due to men's solo out-migration to Europe. This information could not have been obtained if one would have concentrated only on women's fertility, irrespective of the partners' migration trajectory. Taking into account both partners' migratory experience is therefore crucial to the analysis of migrant fertility.

Second, it has been stated that a more holistic view on migration, union formation and fertility was needed (Kulu and González-Ferrer 2014). Many previous studies use event history analysis to study birth transitions. However, this method can only model events in one career and only one transition at a time, e.g. only the transition to the first or second birth. In Chapter 2, I used sequence analysis techniques to overcome this bias. This technique focuses on the trajectory and the identification of patterns of social processes over time. Furthermore, it allows accounting for the timing, sequencing and quantum of several events throughout the life course of an individual. Chapter 2 focuses comprehensively on the timing—and to some extent also on the quantum—of fertility, as well as on union formation, in the immediate time before and after migration, and gives an integrated view on how family formation may evolve in the years surrounding the migration move.

5.3.2 Theoretical contributions

The empirical analyses in all three chapters are based on the migrant fertility hypotheses, which serve as an overarching theoretical framework. Several theoretical propositions can be made that advance the understanding of these hypotheses. First, I tried to shed light on the

selection hypothesis, which has rarely been tested in previous studies on migrant fertility, mainly due to data availability. I interpreted the results obtained in Chapter 3 as an indication that migrants are a selected group with lower fertility levels compared to non-migrant couples. Apparently, this lower fertility is not (only) the result of a temporary fertility disruption due to couple separation or adaptation processes. Couples that migrated together to Europe and have never been separated still have lower fertility levels compared to non-migrant couples. It seems that positive educational selectivity, and especially unobservable—immeasurable—characteristics, are likely to contribute an important share to this difference. These unobservable characteristics seem to influence the decision making process of migrants with regards to fertility, but also regarding their migration strategy, as well as how the interplay of these two demographic phenomena is manifested throughout a couple's life course.

Second, another theoretical implication involves an expansion of the migrant fertility hypotheses to migrants of the 1.5 generation. In Chapter 4 we discussed in detail how and to what extent the socialization and adaptation hypotheses are applicable to child migrants. The middle generation is socialized at both origin and destination, and during their childhood and adolescence—depending on age at migration—they have time to adapt to the fertility patterns prevalent at destination. Moreover, we laid out in detail how parental selective migration is likely to influence the reproductive preferences of child migrants. Although we did not test the hypotheses with empirical data on realized fertility, but on fertility preferences, our rationale should also be applicable to actual fertility behaviour of the 1.5 generation. In particular, our attempt to unravel socialization from adaptation effects contributes to the theoretical understanding of these two mechanisms and how they may vary by age at arrival at destination.

Third, throughout the three chapters I explicitly distinguish between fertility timing and quantum. Although the migrant fertility hypotheses have been tested in many different settings and using different datasets, it is sometimes not explicitly presented which of the hypotheses refer to fertility timing and which to completed fertility, or whether they apply to both. Chapter 3 in particular explores how migration affects fertility timing in the short run and how completed fertility is influenced in the long run. The formulated research hypotheses state clearly which of both concepts—timing or quantum—is referred to and how migration strategies are expected to influence them. Furthermore, it is also presented how both timing and quantum are linked to one another. Future research can benefit from this clear distinction between both concepts, since it may help to identify which one of the hypotheses should be applied, in order to

understand and explain the fertility behaviour in a specific migratory context.

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