Point of reference:
A multidimensional understanding of fertility and migration

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Abstract

Migration is an important social process with far reaching implications for fertility and family change. As such, considerable literature explores whether the fertility of migrants from high fertility contexts converges to that of women in lower fertility destination contexts. Nonetheless, most research investigating the relationship between international migration and fertility outcomes compares the reproductive outcomes of migrants to those of native-born women in receiving countries. Drawing on literature that takes a transnational perspective, we standardize and integrate data from two different sources—one collected in France (the receiving country in our study)—and one collected in African and Asian countries (the senders). Our analyses illustrate how understandings of migrant fertility assimilation differ depending on whether migrant women are compared to non-migrant women in receiving versus sending countries. We also discuss and analyze the role of selection into migration which provides a fuller understanding of processes surrounding migration and assimilation to fertility and family norms in destination-contexts.

Keywords: Migration, fertility, family, assimilation

Introduction

Questions of whether migrants assimilate to the norms, values, and customs of destination contexts have been central to sociological and demographic understandings of migration as a social process (Alba & Nee, 1997). Of particular interest to demographers, is whether international migrants assimilate to the family and fertility norms of receiving countries (Hervitz, 1985; Kulu, 2005; Milewski, 2007; 2010). This topic has generated considerable attention in high-income countries with at or below replacement fertility where migrants from low-income countries often originate from contexts with much higher-fertility. This raises an important question: do migrants from high fertility contexts adjust their fertility to more closely resemble women in lower fertility receiving contexts, or do they continue to have fertility and reproductive patterns that are more similar to women in sending countries?

To date, many of our understanding of whether migrant's fertility converges to that of native-born women in receiving countries have been limited to data sources collected primarily in destination countries (Kulu, Milewski, Hannemann, & Mikolai, 2019). As such, researchers have typically compared migrants to native-born residents of the receiving country, rather than to residents of their country of origin. Nonetheless, this approach has a major limitation. Compared to native-born receiving-country populations, migrants may appear not to have assimilated to local fertility norms because they have much higher fertility. However, this may not be the case if migrants are compared to women in their origin countries with whom they share a common history and culture, among many other similarities. Although scholars of migration have raised this point (Toulemon, 2004a), empirical explorations that take this perspective have been limited. As a result, many of our understandings of whether migrant's fertility assimilates to that of

native-born women in receiving countries may be colored by the choice of reference group and whether migrants are compared to women in origin or destination countries.

A more complete understanding of whether migrant's fertility assimilates to host country norms requires comparing migrants to individuals remaining in their country of origin, which necessitates data on individuals in *both* sending *and* receiving countries. While most datasets include information only on one context or the other, a few notable studies have addressed this by using transnational datasets with information on women in both sending and receiving countries (Lindstrom & Giorguli Saucedo, 2007; 2002; Wolf & Mulder, 2018a) or combining datasets from sending and receiving countries (Choi, 2014; Frank & Heuveline, 2005a; Lübke, 2014; Singley & Landale, 1998; Toulemon, 2004a). Following in this spirit, we standardize and integrate nationally representative micro-data from two different sources—first, the *Trajectories et Origines* (TeO) survey collected in France (the receiving country in our study)—and second the *Demographic Health Surveys* (DHS) collected in ten African and Asian countries (the senders).

In our analysis we focus specifically on international migration from higher fertility settings to France. In the first part of our analysis, we use nationally representative micro-data to compare migrant fertility to non-migrant women in *both* sending and receiving countries, thus providing a more complete understanding of how ideas about migrant's assimilation to fertility in destination contexts are colored by choice of reference group. Given that selection in migration is not random and migrants may be pre-disposed to different fertility norms, the second part of the analysis focuses on selection and migrant fertility processes. To this end we provide a descriptive overview of how migrants and non-migrants in origin contexts differ on observable characteristics. We also conduct multivariate analyses using entropy weights where

non-migrants in origin contexts are weighted to resemble migrants on observable characteristics. This allows us to explore whether the association between migration and fertility differs when controlling for factors that predict selection into migration.

Migration and Assimilation to Fertility Behaviors and Norms

Throughout the literature on migration and fertility the words "adaptation", "adoption", and "convergence" have all been used to refer to the phenomenon whereby women modify their fertility to more closely resemble the destination context. While historical usage of the term assimilation been critiqued for pejoratively implying that migrants should adjust their behavior to more closely resemble that of a "superior" destination context, we follow Alba and Nee's (2009) attempt to reclaim the term by defining assimilation as "a social process that occurs spontaneously and often unintendedly in the course of interaction between majority and minority groups" (827).

There could be a variety of reasons why migrants who originate from higher fertility contexts adopt the receiving country's norms of lower fertility (Alba & Nee, 2009; Carter, 2019; Ford, 1990). First, migrant women may have strong incentives to change childbearing patterns due to the increased financial costs of childbearing in destination contexts. Relatedly, migrant women's improved employment opportunities could increase the opportunity costs of childbearing. At the same time, migration may also lead to important changes in norm, preferences, and values. Migrant women may come to prefer smaller family sizes due to the influence of media or social interactions with peers, co-workers, or other members of soicety.

Considerable literature has explored whether migrant fertility converges with that of native-born women in a way that would be consistent with an assimilation perspective. In

contemporary European contexts, first-generation migrants from high-fertility countries in Africa and Asia have been shown to have higher fertility than non-migrant populations in Germany, France, the UK, and Sweden (Afulani & Asunka, 2017; Andersson, 2004; Coleman & Dubuc, 2010; Héran & Pison, 2007; Milewski, 2007; 2010; Toulemon, 2004a). In the US, some research suggests first generation Mexican migrants to the US have significantly higher fertility than native-born Caucasian populations (Bean, Swicegood, & Berg, 2000; Frank & Heuveline, 2005b), although other scholarship suggests this empirical finding is largely a function of measurement (Parrado, 2011). In spite of these broader trends, there is variation in fertility across migrant descendant groups within host countries which has been attributed to a range of factors including differences in religiosity and socio-cultural norms about family (Kulu et al., 2017).

The fact that in the first-generation migrant women's fertility is often higher than native born women has led scholars to argue that socialization prior to migration is essential to shaping values, preferences, and beliefs about reproduction (Barber, 2001; Carter, 2019; Milewski, 2010). According to this perspective, because adult migrants have already been influenced by the (usually higher fertility) norms of their country of origin, migrants from high fertility contexts may not adjust their fertility behaviors upon migration. At the same time, transnational linkages via friends and family, migrant communities, return visits, or media in home countries allow women to maintain active contact with the norms in destination countries that may also reinforce high fertility (Levitt & Glick Shiller, 2019; Portes, Guarnizo, & Landolt, 1999; Vertovec, 2004).

Nonetheless, the fertility assimilation perspective gains support from studies showing that women's fertility behavior increasingly resembles that of women in destination countries the longer they are in destination countries (Ford, 1990). Further support to the assimilationist

perspective comes from studies that show the fertility of second-generation migrants often more closely resembles that of non-migrant populations in receiving countries (Kulu et al., 2017; Milewski, 2010; Pailhé, 2017; Parrado & Morgan, 2008). Nonetheless, there are several important exceptions to trends of fertility declines in the second generation in Europe—including second-generation Turkish women in Sweden and second generation Pakistani and Bangladeshi women in the United Kingdom and second-generation Turkish women in France (Andersson, 2004; Kulu et al., 2017; Pailhé, 2017).

It is also plausible that a negative association between migration and fertility can be explained by differential selection into migration. The decision to migrate is not random, and those who select into migration may be systematically different in family background, education, values, and ambition among other things (Feliciano, 2005; Ichou, 2014; Rendall & Parker, 2014; Spörlein & Kristen, 2019). While there is debate about the extent to which migrants are positively or negatively selected relative to non-migrants in origin contexts (Lee, 1966; Portes & Rumbaut, 1990), selection may mean migrants would have had differential fertility behaviors irrespective of migration (Hervitz, 1985; Lindstrom & Giorguli Saucedo, 2002; Milewski, 2007). Even if migration does have a negative effect on fertility net of selection, this could due to disruption of processes of fertility and family formation that occur in the post-migration period as opposed to assimilation alone (Kulu, 2005). For example, spousal separation, and/or psycho-social stress often accompany migration, all of which can (at least temporarily) depress fertility. Nonetheless, in some contexts, disruption in fertility in the migration period is compensated for in later periods with accelerated patterns of child bearing in the post-move period (Choi, 2014; Lübke, 2014).

The vast majority of studies that have assessed migrant's fertility assimilation have

compared migrant's to native-born women in destination contexts. This is likely because few data sources collect information on women in both sending and receiving countries, though notable exceptions include the Mexican and Latin American Migration Projects (MMP and LAMP) and Migrations Between Africa and Europe Project (MAFE). Using the MMP, research suggests that Mexican women who migrate to the US have lower birth probabilities and lower total births while in the US compared to women in Mexico (Lindstrom & Giorguli Saucedo, 2007; 2002). Likewise, using MAFE, Ghanaian migrants to the UK and the Netherlands are found to have fewer total children than non-migrant Ghanaian women (Wolf & Mulder, 2018b). Nonetheless, these data sources are somewhat limited because they are not based on nationally representative samples, lack information on reproductive health outcomes, and often have very small sample sizes that limit statistical power.

A few studies have combined data sources in a similar spirit to our analyses (Choi, 2014; Frank & Heuveline, 2005b; Lübke, 2014; Singley & Landale, 1998; Toulemon, 2004a). These papers typically compare aggregated measures of total fertility in both origin and destination contexts (with the exception of the Singley and Landale and Lubke studies which conduct multivariate analyses using pooled micro-data). Findings of these studies are heterogeneous, for example Frank and Heuveline document that Mexican-origin women in the United States have higher fertility rates than Mexican non-migrants, whereas Choi shows that Mexican migrants to the US have fertility rates that more closely resemble Caucasian Americans than pre-migration fertility trends in Mexico. However, even these exceptional data sources are limited largely to macro-level estimates (with a few exceptions) that do not address how migrants might be different than non-Migrants. Furthermore, most lack information on reproductive health outcomes because they rely on a combination of Labor Force Surveys and Population Censuses

that do not contain this information.

Migration and Fertility in France

France provides an interesting case of a high-income country with a large and diverse migrant population. As of 2014, about 9% of the French population was foreign-born (compared with 13% in the United States at the time) (INSEE, 2016; Pew Research Center, 2016); migrants from Portugal, Morocco and Algeria made up the largest sending groups. The descendants of the foreign-born population compose about an additional 10 percent of the population (INSEE, 2012), which means about 20% of the population has foreign origins if both the first and the second generations are considered jointly. For the purposes of this paper we focus on international migration from outside of Europe since these migrant women come from countries with fertility above replacement levels.

Large-scale migration from outside of Europe to France started in the mid-twentieth century when foreign laborers were recruited to assist in post-World War II reconstruction from former colonies in North Africa (Alba & Foner, 2015). While the earliest migrants were often single men, family reunification policies allowed women and extended family members to join in the 1970s and 1980s (Laurence & Vaisse, 2006). More recent waves of migration have included both people who migrate for economic reasons and people leaving difficult political situations. As migrant sending countries have diversified over time, non-European migrants to France have come to be a highly heterogeneous group including people with origins in North Africa, Turkey, Sub-Saharan Africa, and Asia. In 2016, there were almost 1.8 million migrants in France born in North Africa, close to 1 million migrants in France born in sub-Saharan Africa, and just under 250,000 migrants in France born in Turkey (INED, 2019).

Overall fertility in France remains just under replacement levels among native-born women which is attributed a history of pro-natalist policies (e.g. allowances, tax deductions, child daycare etc.) (Pailhé, 2008; Toulemon, Pailhé, & Rossier, 2008). First-generation migrant women from non-European origins, including Northern Africa, Asia, sub-Saharan Africa, and Turkey, have been shown to have higher fertility than native-French women (Afulani & Asunka, 2017; Héran & Pison, 2007). Nonetheless, the higher fertility of many first-generation immigrants from non-Western countries in France obscures the fact that their TFRs are often between that of their origin country and that of native French women (Toulemon, 2004b) and that their overall contribution to national fertility rates is minimal (Héran & Pison, 2007). Furthermore, the fertility of the second generation often converges with native French women (Kulu et al., 2017; Pailhé, 2017), though there are exceptions to this trend—for example, descendants from Turkey have higher first and second birth transition rates than native French women, though these effects disappear when controlling for compositional effects (Pailhé, 2017).

France provides an interesting case base because many non-European migrants come from high-fertility countries with TFRs well above replacement. For example, the TFRs in Algeria, Senegal, and Niger—three countries with sizeable migrant populations in France—are 3, 4.7, and 7 respectively (World Bank, 2017). In contrast, in the United States—which has received considerable attention in the literature on migration and fertility— the largest migrant sending groups come from Latin American countries that have already undergone the fertility transition. France also provides an interesting case because of a strongly assimilation oriented model of immigrant integration (Alba & Foner, 2014; 2015), which makes question of whether or not migrants assimilate to the fertility and family norms of destination contexts particularly pertinent.

Analytical Strategy

Data and Sample

Our analytic sample consists of a combination of TeO and DHS respondents. To achieve this, we create standardized variables that are consistent across the two data sources and then append these data sources to create a harmonized dataset. Doing allows us to identify and compare respondents in sending countries who did not migrate to respondents in receiving countries who did migrate but who are otherwise comparable on observed characteristics. In what follows we describe the two data sources and the sample creation.

The TeO is a cross-sectional survey of approximately 22,000 women and men ages 18-60 in metropolitan France. The central focus of the TeO is immigrant integration processes. As such, the sample includes detailed information about immigration status, religion, integration, discrimination, assimilation, fertility, reproductive health, and socioeconomic status. Immigrant groups are oversampled in the TeO, but the dataset is nationally representative when sampling weights are applied. In total, the final TeO sample is comprised of five groups: (1) 9,600 migrants; (2) 9,600 native descendants of migrants; (3) 800 people from French overseas territories residing in France; (4) 800 descendants from French overseas territories; and (5) 3,200 native descendants of native-born French.

The DHS are nationally representative, cross-sectional surveys collected among women aged 15-49 in dozens of countries in sub-Saharan Africa, North Africa, and Asia. Like the Teo, the DHS provides detailed information about education, reproductive health, fertility, and intra-family dynamics. Importantly, DHS data are standardized across countries, thus allowing us to pool the data and to make cross-national comparisons. We focus on DHS data from countries and

time periods comparable to that of TeO (in approximately 2008/2009). For DHS surveys in countries with multiple waves collected within five years of the TeO we include both DHS survey waves. Appendix Table 1 provides a list of the countries years for the TeO and DHS samples included in this study.

Leveraging TeO data provides a subsample of first-generation migrant women born in ten countries from four different regions that also have DHS studies collected in the relevant timeframe. This includes four countries from West Africa (Cameroon; Ivory Coast; Mali; and Senegal); two countries from Central Africa (Congo Brazzaville; Congo DRC); two countries from the Middle East and North Africa (Morocco and Turkey); and two countries from South-East Asia (Cambodia and Vietnam). As Appendix Table 1 shows, the Total Fertility Rates (TFRs) of the women from these countries at survey ranged from a high of 6.67 in Mali to a low of 1.9 in Vietnam, which was similar to the TFR of France at the time. In general, women from sub-Saharan Africa had the highest TFRs.

Table 1 provides information about the sample sizes of women in origin countries, migrant women, and non-migrant women in France (we have information on 3,781 French women who are not of migrant origin from the TeO). Our small first-generation migrant samples noted in Table 1 are fairly consistent with those in the existing literature. Nonetheless, to avoid bias due to the disproportionately larger samples of non-migrants in sending countries relative to the sample of migrants in France, we take a random draw of 350 women from each of the non-migrant sending samples and non-migrant French sample. Table 1 Column 2 provides final analytical samples sizes, and ensures that first generation migrants constitute at least 25% of the relevant analytical samples.

Measures

In all surveys, respondents are asked about their family and demographic background, fertility history, current reproductive health, and relationship dynamics. We create unified measures of fertility, reproductive health outcomes, socioeconomic status, and sociocultural background across the TeO and DHS.

Fertility outcomes: We create continuous measures of total children born as our main measure of fertility. We also create a series of timing variables for event history analyses where we look at the age of women's transitions to first birth (starting risk at age 15); the age of women's transitions to second birth (conditional on having a first birth); the age of women's transitions to third birth (conditional on having a second birth); and the age of women's transitions into unions—which includes either marriage or long-term cohabitation (starting risk at age 15). To provide further insight into whether women's preferences are also be impacted by migration we also include a measure of women's stated ideal number of children. Women who provide non-numeric responses are excluded from this measure; about 8.78% of women in the DHS sample provide a non-numeric response (i.e. "Up to God"), 6.5% of women in the TeO sample report that they do not know and .24% of women in the TeO sample refuse to respond to this question.

Migration status: We consider two different migration comparisons. The first is a dichotomous measure indicating that a woman is a first-generation migrant to France, where the reference is non-migrant women in sending countries. The second is a dichotomous measure indicating that woman is a first-generation migrant to France, where the reference is non-migrant women in the receiving country (e.g. French natives of non migrant origin).

Factors that influence selection into migration: First, we include a measure of education, which past literature has shown to be an important predictor of migration (Feliciano, 2005; Ichou, 2014; Rendall & Parker, 2014; Spörlein & Kristen, 2019). Furthermore, education is an important determinant of socioeconomic status, which may also influence people's abilities to migrate given the need for resources. We measure education with a series of indicator variables including no diploma; primary diploma; some secondary; secondary diploma; and tertiary.

We also include a control for number of siblings, which may proxy for norms valuing large family sizes learned in childhood since research suggests that norms about childbearing and desired family size are shaped by experiences and socialization in childhood. Furthermore, sibling size may also capture socioeconomic status given the well-documented negative association between mother's education and total fertility outcomes. We include a series of indicators for whether the respondent has 0-1 siblings; 2-3 siblings; 4-5 siblings; or more than 6 siblings (this measure is unavailable in Vietnam).

Factors related to assimilation and transnationalism: In supplementary models, we explore factors related to assimilation and transnationalism to explore their role in predicting the fertility of migrant populations. This includes a set of dichotomous indicators about the age the women migrated and how long ago the migration occurred (because women who migrate at younger ages and longer ago would be more likely to have adopted norms of the reference country); a dichotomous indicator of whether the woman reports feeling French (a measure of self-perceived integration into French society); a dichotomous indicator of whether the woman reports that she regularly engages with media from the home country (a measure of transnational engagement with the home country); and a dichotomous indicator of whether she regularly visits her home country (a measure of transnational engagement with the home country).

Age: All models also include age fixed-effects to account for age-related fertility differentials.

Methods

The first part of our analysis explores a central question: does reference group matter for understandings of migration and fertility convergence? To this end, we produce descriptive estimates, by country of origin, that show how the linear association between migration and fertility outcomes differ depending on whether first generation migrants are compared to women in sending countries (Comparison 1) or women in receiving countries (Comparison 2). In these estimates we control only for age fixed-effects and use sampling weights from both the DHS and TeO to ensure representativeness. Because right censoring is a concern with our measure of total fertility, we also produce a series of Kaplan-Meir survival curves that make the same comparison looking at the timing of first births, second births, third births, and first union formation.

However, selection into migration is not random and migrants may be pre-disposed to different fertility norms, thus the second part of the analysis explores selection processes and their role in explaining observed changes. To better understand selection we provide a descriptive overview of how migrants and non-migrants in origin contexts differ on education and number of siblings and why the migrants in our sample reported migrating on their application for legal residence. To find insight into whether the findings from part one change upon accounting for selection into migration we use linear regressions with entropy balancing techniques where non-migrants in origin contexts are weighted to resemble migrants on observable characteristics. To conduct the entropy balancing, we generate a set of weights that makes the non-migrant respondent's education and sibling sizes match the migrant respondent's

education and sibling size on mean, variance, and skew. We then run the linear regressions using these weights (along with age fixed effects). Entropy balancing is similar in spirit to propensity score matching (PSM), however, PSM assumes a functional form, which may cause more unbalance than balance, particularly given the small sample sizes in our analyses. We use linear probability models for all regression analyses for ease of interpretation of results and to conduct the entropy weighting exercise. For the entropy balancing exercise, we limit migrants to women who migrated after the age of 15 (e.g. eliminating the so called "1.5 generation") to ensure that education was likely completed prior to migration and fertility commenced only following migration. Results are robust to also limiting to migrants who came over the age of 20, although for some countries the sample of migrants becomes very small with this restriction. As a result, the point estimates generated here are slightly different from those in the first part of our analysis because we focus on a slightly different sub-sample of women.

As a final step, we conduct multivariate analyses of whether factors associated with assimilation and transnationalism predict fertility outcomes among the population of migrant women. Given that we can't fully disentangle assimilation from selection, this provides further insight into whether and how assimilation processes might be related to fertility outcomes.

Results

Does Reference Group Matter for Understandings of Migration and Fertility Convergence?

The first aim of this study is to understand how the tradition of comparing migrants to host-country natives may has shaped contemporary understandings of the relationship between migration and fertility. To do so, we compare the weighted, age-adjusted reproductive outcomes of migrants in France to those of (1) non-migrants from the same country of origin and (2)

French country natives. As can be seen in Figure 1, parity at survey is consistently higher among migrant women compared to non-migrant French natives, ranging from Cameroonian migrants having on average 0.32 more children than French women to Malian migrants having an average of 2.17 more children than French women (Figure 1). These findings are roughly in line with a large body of research, which shows that first generation migrants have higher fertility than native-born women, thus casting doubt on whether adaptation occurs in the first generation due to strong adherence to home-country norms. In other words, this could appear to support the socialization perspective that first-generation migrants adhere to the norms of their home countries.

In contrast, as can also be seen in Figure 1, findings look considerably different when migrants are compared to women from their sending countries who did not migrate. In this case, parity at survey is consistently lower among migrant women than among non-migrant women who remain in the country of origin, a pattern that holds in every country except Turkey. Moreover, the estimated parity differential is sizable, ranging from 0.67 fewer children among Moroccan migrants to 1.71, 1.97 and 2 fewer children among migrants from Mali, Cambodia and Cameroon respectively (relative to women who remain in those countries). Thus, these findings are suggestive that suggest that some degree of adaptation is occurring, even if migrant fertility remains higher than women non-migrant French women.

[Figure 1]

As a next step we explore how migration influences the transitions into first, second, and third births by presenting series of Kaplan-Meir Survival Curve estimates. As Figure 2 Panel A shows, in most cases in our studies migrant women transition into first birth more slowly than non-migrants in origin countries, but more quickly than native-born French women. There are a

few exceptions to this general trend. In Turkey and Morocco, the transitions into first births of migrant and non-migrant women in origin contexts look similar, and in Vietnam the transitions into first births of migrant and non-migrant women in France look similar. The general pattern in findings is broadly similar for the transitions to second births (Figure 2, panel b). The gap between migrants and French women widens considerably in the transition into third birth for migrants from every country in our analysis (Figure 2, panel c). Furthermore, third birth transitions of migrant women from Cambodia, Congo, DRC, Mali, Morocco, Senegal, and Vietnam much more closely resemble women in origin countries than in France. For Turkey, migrant women transition into third births more quickly than non-migrant counterparts in countries of origin.

[Figure 2]

Because the transition into childbearing is closely linked to union formation in origin countries we also look at Kaplan-Meir Survival Curve estimates of the timing of union formation. In most cases, the timing of union formation for women in France more closely resembles women in France than in origin contexts. Exceptions include Morocco, where all three groups look similar, and Turkey where migrants look more similar to Turkish non-migrants. Nonetheless, the delayed transitions into unions could help explain the delayed transitions into first birth described in Figure 2, which may be related to disruption of fertility and family life upon migrating to a new context.

[Figure 3]

As a next step, we explore linear predictions of women's ideal family sizes to provide insights into whether some of the trends observed might reflect a change in women's fertility preferences as opposed to a more mechanical change in fertility due to high costs of childbearing

in France, delay of fertility timing due to disruption etc. Ultimately, Figure 4 shows similar patterns to those for the total fertility outcome. That is, in every country except Turkey and Vietnam, migrant women in France report lower ideal family sizes than non-migrant women who remain in the country of origin. The discrepancy is particularly striking for migrants from Mali, the DRC, and Cameroon who report ideal family sizes 2.42, 2.20, and 2.55 lower than women in their home countries. Yet, when compared with French country natives, migrant women from seven of the ten countries report higher ideal fertility. For example, women from Mali, the DRC and Cameroon have ideal family sizes are 1.8, 1.3, and .82 higher than native-born French women.

[Figure 4]

In sum, our first analytic component reveals two important takeaways. First, migrant women tended to exhibit lower parity, lower ideal fertility, and slower transitions into first births an first unions than did non-migrant women who remained in the country of origin (with a few notable exceptions), which largely supports an adaptation perspective. Second, these patterns contrasted sharply with estimated differences between migrant women and French country-natives, thus estimates based on this comparison alone might present an incomplete picture of migrant fertility. This illuminates how point of reference, or comparison group, is critical to how scholars conceptualize the relationship between migration and fertility.

The Role of Selection into Migration: Do Migrants in France Differ from Non-Migrants in Their Country of Origin in Ways that May Affect Fertility?

Having demonstrated the salience of the reference group, we next turn our attention more squarely toward comparisons between migrants and non-migrants residing in the country of

origin. An important step in this comparison is to identify pertinent differences between the two groups that may simultaneously affect a woman's propensity to migrate and her fertility ideals and behaviors. In that vein, Figure 5 compares the educational background of migrants and non-migrants. As can be seen in this figure, for every country except Turkey, a smaller proportion of migrant women have no schooling (red bars) and a greater proportion of migrant women have tertiary schooling (navy bars) than women who remain in the country of origin. Moreover, the fraction of migrant women who have middle or secondary education (green or blue bars) relative to primary education (yellow bars) is greater than the fraction observed among non-migrant women. In other words, migrant women are not only more likely to *ever* attend school than non-migrant women but also attain more schooling on average when they do attain school.

[Figure 5]

Migrant women also differ from non-migrant women residing in their origin country with respect to their average number of siblings, though differences between migrants and non-migrants are not as striking as was the case in education (Figure 6). Women who have migrated to France from Cambodia, Morocco, and Turkey tend to come from smaller families than to women who remain in those countries. That is, they are more likely to have <=1 sibling (red bars) and less likely to have >=6 siblings (blue bars) than women who remain in those sending countries. However, women who have migrated from Mali are more likely to come from a large family, where they had >=6 siblings, than women who remain in Mali (Figure 6).

[Figure 6]

To better understand the different reasons why women select into migration, Table 2 presents descriptive information on the initial reason for migration that migrants in the sample put on their application for a residence permit in France. Table 2 shows marked regional

heterogeneity in trends. For example, in South East Asia over 50% of women reported migrating claimed political asylum as refugees. In contrast, in West Africa less than 2% of women claim refugee status, and the most common reason women report migrating is for family reunification (e.g. 46% of women claim this reason). Among women from the Middle East and North Africa, family reunification is by far the most dominant reported reason for migration, with just under 70% of women from MENA in the sample providing this justification. For Central African migrants, the most commonly cited reasons for migration included refugee status (28% of respondents) and family reunification (22% of respondents). Although reports of migration for work are low (range from 1 to 7%), this likely reflects that these are only people who are applying for legal residence; it is possible that respondents who are missing on this question or reported "other" as an answer are economic migrants.

Taken together, the analyses presented in Table 2 and Figures 2 and 5 better elucidate the processes related to selection into migration. Migrants come to France for a variety of reasons including political asylum, family reunification, and economic prospects. However, migrant women residing in France tend to differ from non-migrant women residing in the sending country in at least two pertinent ways: They are more educated on average, and further, in some cases, they have differing numbers of siblings.

Does the association between migration and fertility change upon accounting for factors that predict selection into migration on observable characteristics?

Considering significant differences in the educational and familial background of migrants and non-migrants, we test how our baseline descriptive estimates change upon accounting for selection into migration on observable characteristics. Table 3 panels A and B

present results of the association between migration and current parity for each of the ten countries. For each country, the first column presents age-adjusted estimates of associations between migration and parity at survey among women who migrated over age 15 compared to women who did not migrate; the second column presents age-adjusted estimates of associations between migration and parity at survey using entropy balancing to weight non-migrant women's education and sibling size to resemble those of migrant women, thus helping to account for selection on migration on observable characteristics.

In all of the countries other than Turkey adjusting for these factors reduces the magnitude of the estimated effect of migration. However, in every country other than Morocco, the estimated effect of migration on fertility retains its statistical significance even after introducing controls for selection into migration and entropy weights that re-weight migrants and non-migrants to be similar on observable characteristics. These results thus indicate that, for most of the countries we examine selection into migration on observable characteristics explains some, but not all, of the association between migration and fertility. This suggests, that although migrant selectivity is an important part of the story, there is still some evidence of adaptation to host country norms. Although we cannot rule out the possibility of unobserved selectivity into migration the overall high r-squared in the analysis (ranging from 0.31 to 0.85) do suggest that a fairly high proportion of the variance in fertility is explained by variables in the model.

In Table 3 panels c and d we replicate the same analyses with the ideal family size outcome. Like parity, differences in ideal fertility between migrant and non-migrant women (residing in the origin country) are reduced somewhat—but not entirely—by controlling for these background factors . This pattern is observed in all of the countries with the exception of Moroco

and Vietnam (where the association between migration and ideal family size is null) and in Turkey where the association becomes significant upon weighting.

Because we cannot fully rule out selection in exploring the association between migration and fertility Table 4 presents a series of multivariate analyses that further explore whether factors associated with adaptation (e.g. duration of time in the country, "feeling" French etc.) are associated with fertility outcomes among migrant populations. In support of this perspective, we find that women who report "feeling French" have significantly lower parities and lower ideal family sizes than women who do not. At the same time, women who came to France after the age of 25 have significantly higher parities and ideal family sizes than women who came before the age of 16, which suggests that timing of arrival during the life course is an important determinant of migrant women's fertility. Finally, our main measure of transnationalism—whether the woman regularly watches media from her home country—is positively associated with fertility and ideal family norms, which supports the perspective that women who continue to have strong linkages or attachment to host country norms may continue to have the fertility norms of the destination context.

Discussion

Though a vast body of literature seeks to understand whether migrants assimilate to the fertility norms in destination contexts, most studies have compared the reproductive outcomes of migrant women—usually from higher fertility contexts—to those of non-migrant natives from comparatively lower fertility contexts. Our analysis enhances existing work on the topic by using nationally representative micro-data to compare migrant fertility to non-migrant women in *both* sending and receiving countries, thus providing a more complete understanding of how our

understanding of migrant fertility are colored by choice of reference group. We provide these estimates for women from 10 African and Asian countries that are represented in both the DHS and the TEO, which allowed us to explore similarities and differences in migrant's fertility experiences across multiple sending countries.

Our analyses revealed an important pattern: across most sending countries, migrant women were on a trajectory toward lower fertility than non-migrant women of the same age in their country of origin. That is, migrant women tended to have lower parity and wanted fewer children than women who remained in their sending country. In sharp contrast, the opposite pattern was observed when comparing migrants to native French women. In other words, the point of reference determined the direction of associations and this rang true across most sending countries represented in our sample. That migrant women's parity was lower than non-migrant women's of the same nationality but higher than French women's is consistent with the adaptation/ assimilation hypothesis. That is, migrants' parity may fall between the two groups because their perceived fertility norms are reduced from high when in their country of origin to comparatively more moderate once abroad in a lower fertility context. This interpretation is supported by migrant women's *ideal* fertility also being lower than non-migrant women's of the same nationality but higher than French women's. Though we cannot full account for selection into migration, our analyses that explored how estimates change upon taking into account observable characteristics provided further support to these findings.

Although our study made a number of interventions in the literature, it had limitations as well. Migration is often circular, however our sample is limited to cross-sectional data that do not permit us to observe whether respondents in sending countries will eventually migrate, or if migrants in France will eventually return home. Another limitation of our study is that we

control for selection on observed characteristics only, and relatedly, are limited to variables that appear in both the TeO and the DHS. As a result, we cannot wholly account for unobserved characteristics that may affect both migration and fertility. Nonetheless, these findings highlight the need to expand current paradigms used to describe the relationship between migration and fertility and to develop new data sources that enable scholar to more comprehensively understand how migration shapes women's reproductive trajectories relative to both sending country non-migrants and destination country natives.

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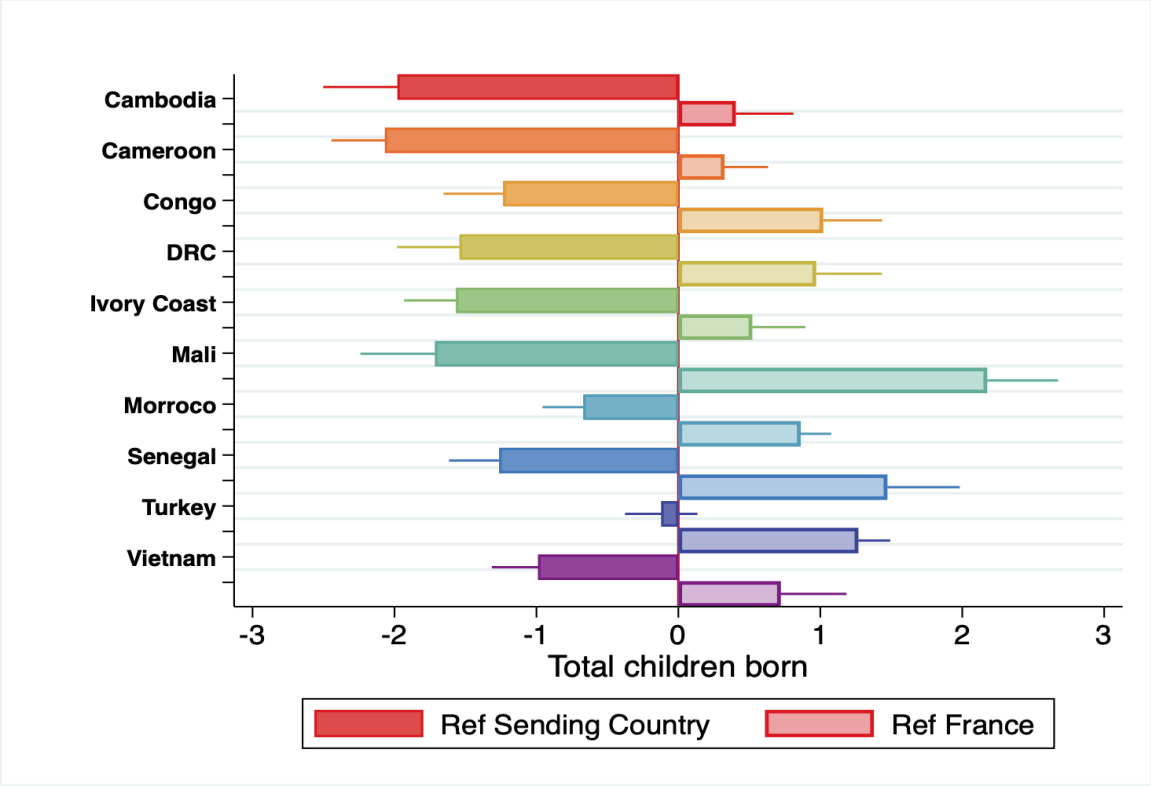
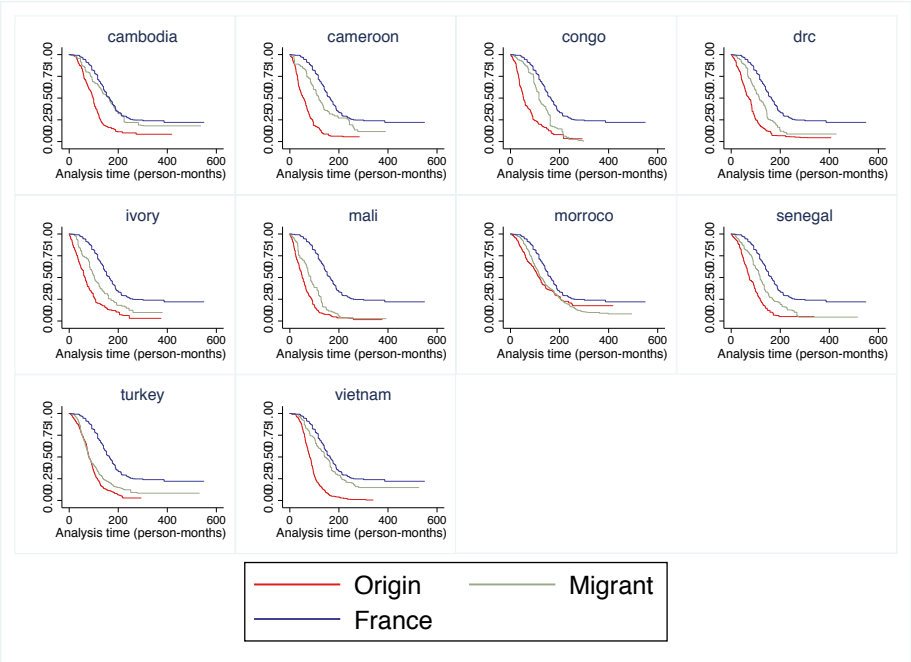
Figure 1. Linear regressions of the association between migration and parity (with age fixed effects) comparing first generation migrants to non-migrant French women and first-generation migrants to non-migrant women in sending countries. All estimates are weighted using survey weights provided by DHS and TEO.



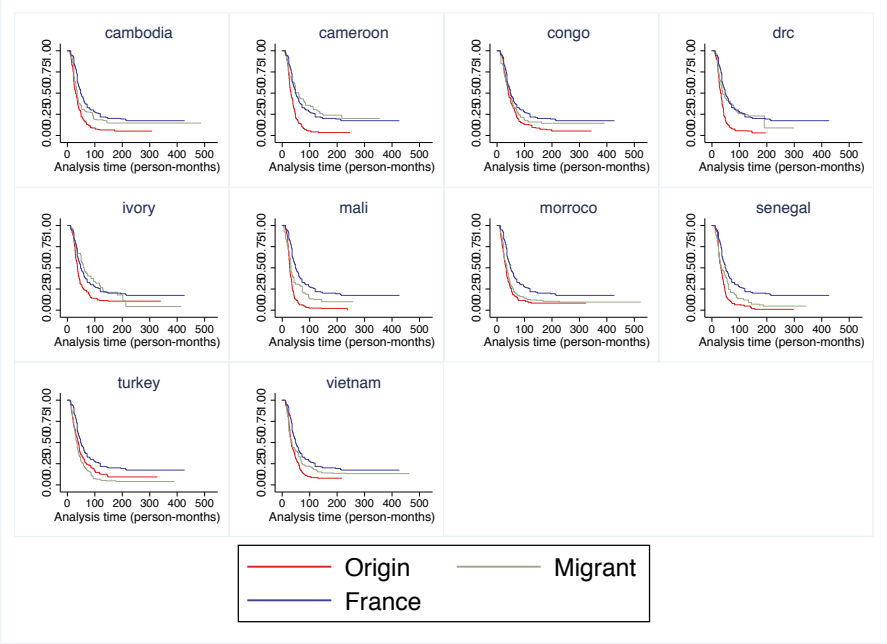
Source: DHS and TEO

Figure 2.

Panel A. Transitions into first births



Panel B. Transitions into second births



Panel c. Transitions into third births

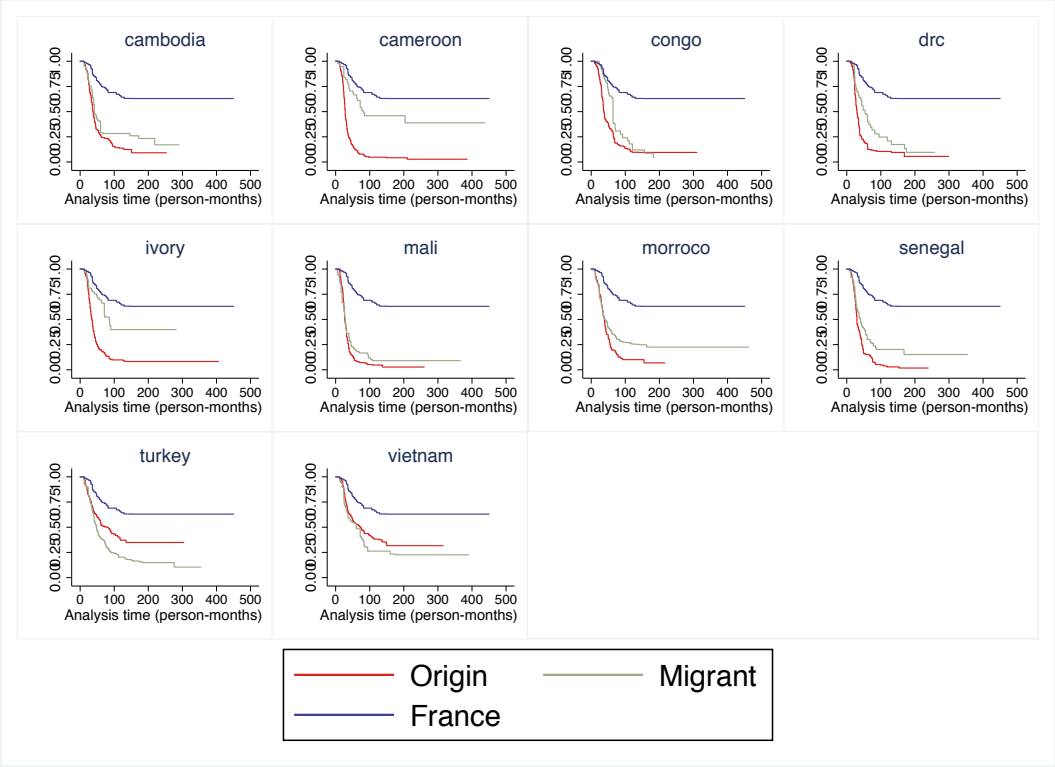


Figure 3. Transitions into unions

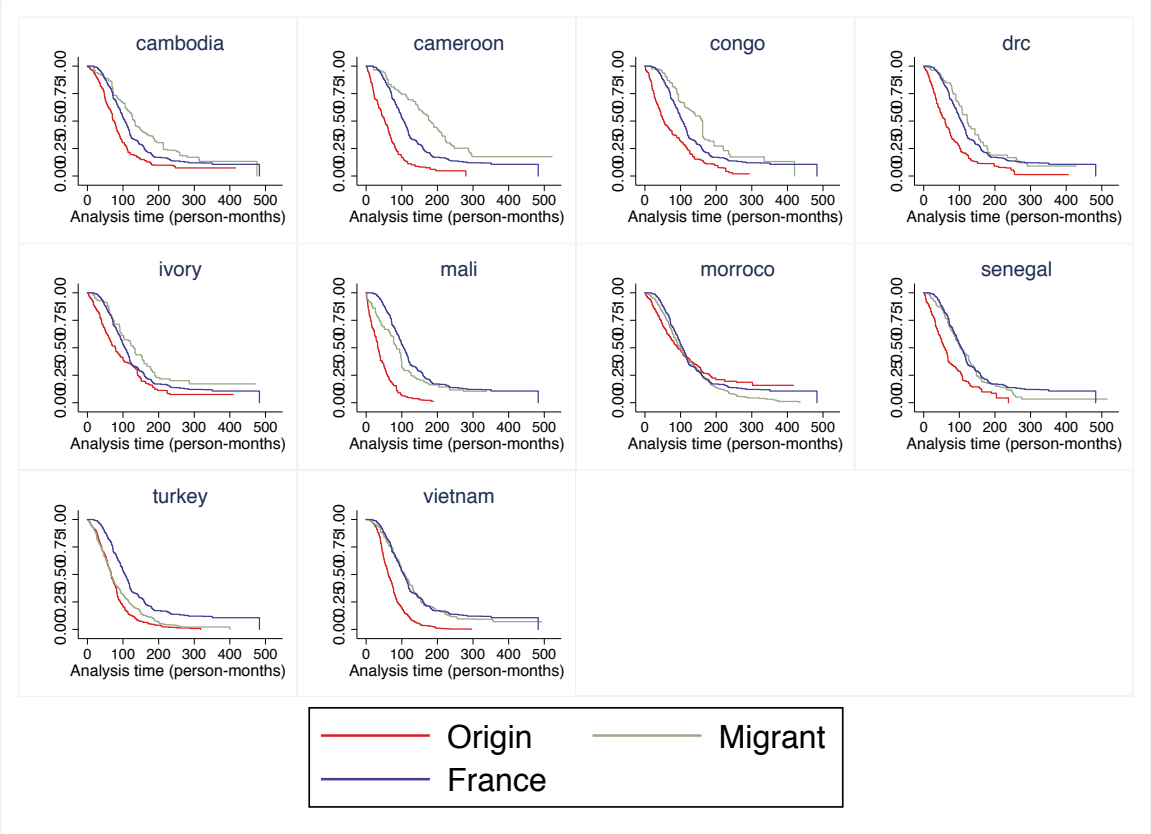
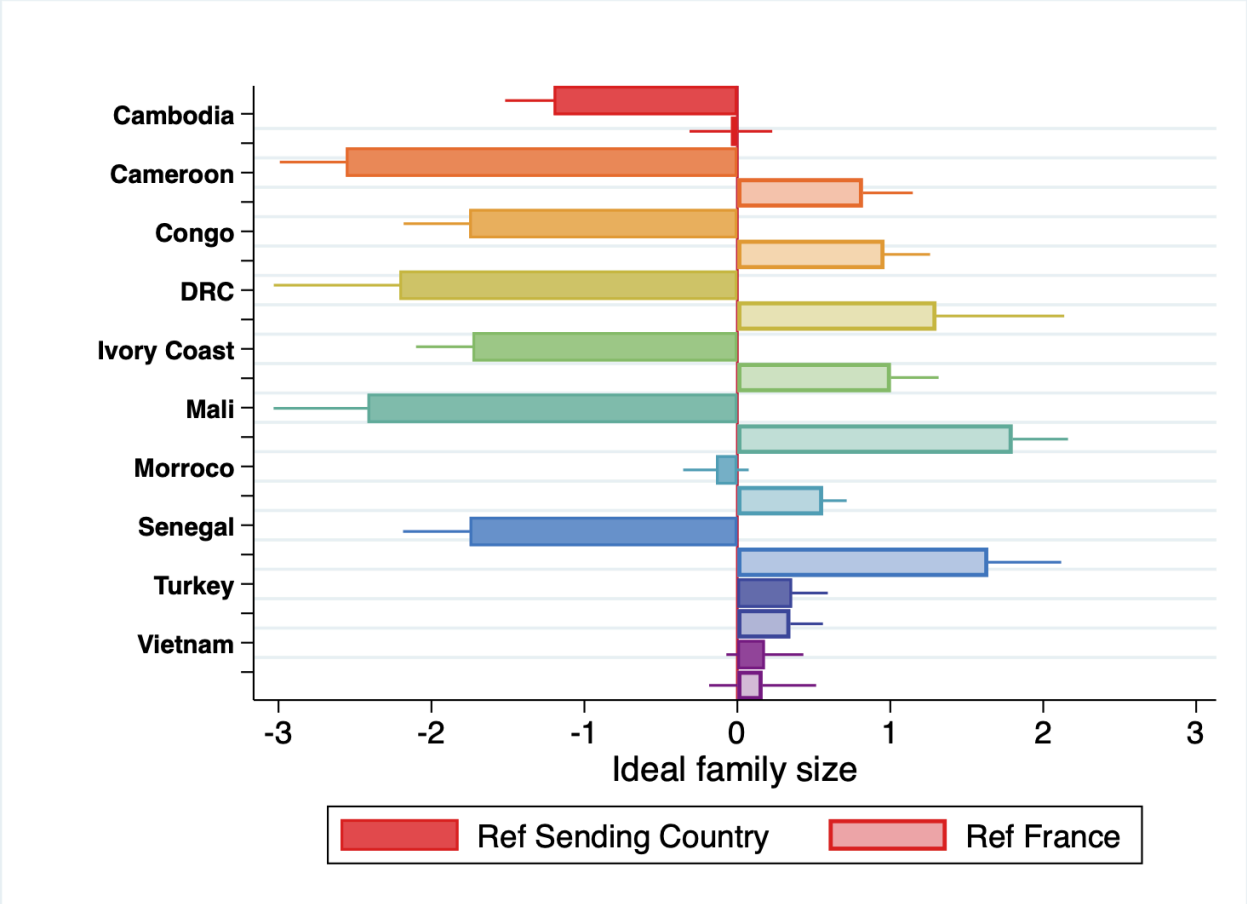
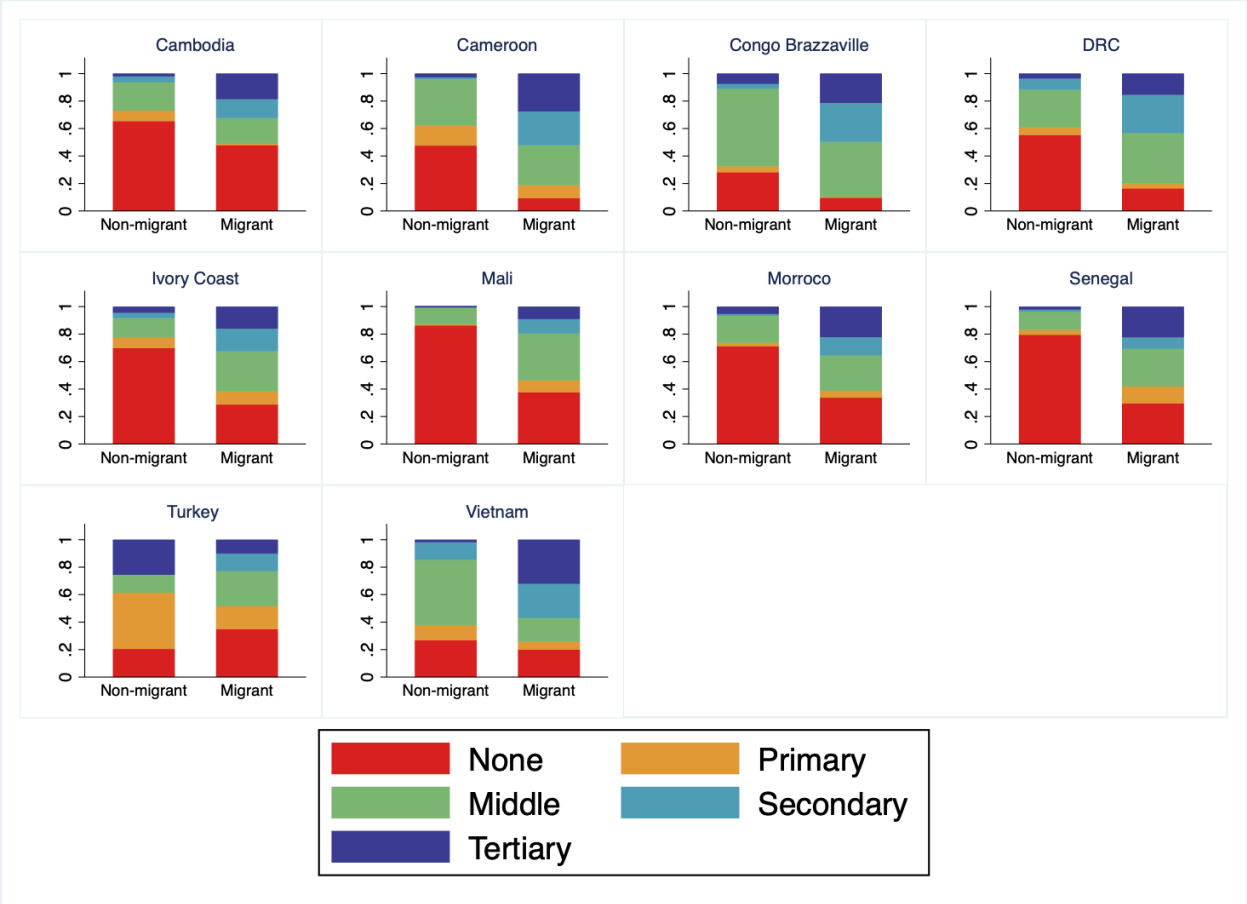


Figure 4. Linear regressions of the association between migration and ideal family size (with age fixed effects) comparing first generation migrants to non-migrant French women and first-generation migrants to non-migrant women in sending countries. All estimates are weighted using survey weights provided by DHS and TEO.



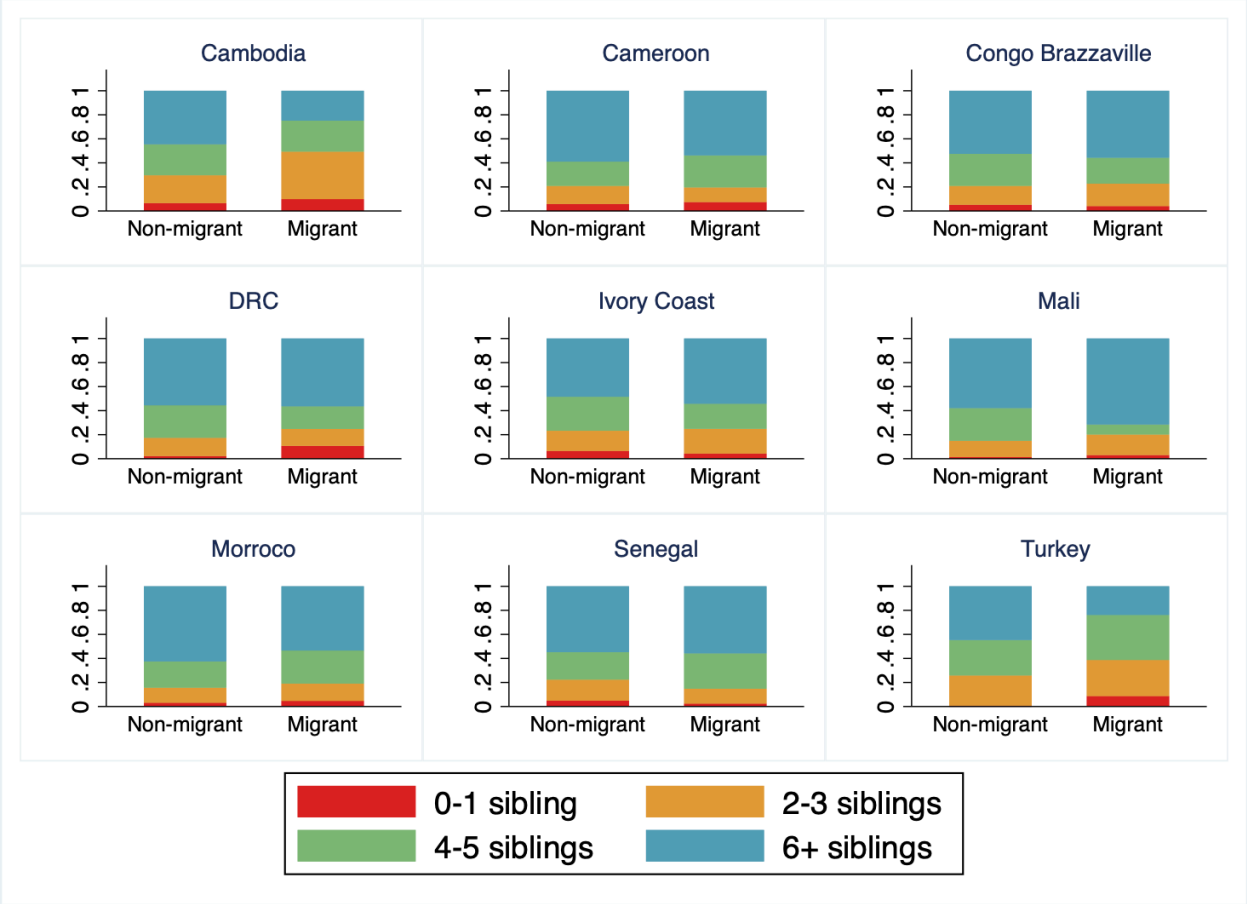
Source: DHS and TEO

Figure 5. Descriptive comparison of education level of migrants in France and non-migrants from sending countries. All estimates are weighted using survey weights provided by DHS and TEO.



Source: DHS and TEO

Figure 6. Descriptive comparison of sibling size of migrants in France and non-migrants from sending countries (no sibling information available for Vietnam). All estimates are weighted using survey weights provided by DHS and TEO.



Source: DHS and TEO

Table 1. Overview of analytical sample.

	(1) Raw sample			(2) Final analytical sample		
	1st gen migrants in France	Non migrants in sending countries	Non-Migrant French	1st gen migrants in France	Non migrants in sending countries	Non-Migrant French
Cambodia	116	35,577	3,781	116	350	350
Cameroon	95	26,082	3,781	95	350	350
Congo	80	17,870	3,781	80	350	350
DRC	86	9,995	3,781	86	350	350
Ivory Coast	95	10,060	3,781	95	350	350
Mali	88	14,583	3,781	88	350	350
Morocco	486	16,798	3,781	486	350	350
Senegal	169	30,290	3,781	169	350	350
Turkey	385	7,405	3,781	385	350	350
Vietnam	186	5,665	3,781	186	350	350

Data from TeO (2008-2009); Cameroon DHS (2004, 2011); Congo Brazzaville DHS (2005, 2011); DRC DHS (2007); Cote D'Ivoire DHS (2011); Mali DHS (2006); Senegal DHS (2005, 2010); Morocco DHS (2003); Turkey DHS (2008); Cambodia DHS (2005, 2010); Vietnam DHS (2002).

Table 2. Descriptive information on why women reported migrating on their application for a residence permit broken down by region. Weighted using sampling weights provided by TEO.

	SE Asia	West Af.	Central Af.	MENA
Refugee	50.75	1.74	27.91	2.41
Student	7.44	14.19	10.59	9.29
Worker	1.04	8.42	7.34	5.13
Family Reunification	13.92	44.51	21.75	68.22
Other/DK/Refuse	15.59	24.83	26.96	11.91
Missing	11.27	6.31	5.46	3.04
N	289	433	164	862

Table 2. The association between migration and total children born comparing migrants to non-migrants in sending countries. Linear probability models (LPM). Migrant sample is limited to women who migrated over the age of 15.

Panel A.	(1) Baseline	(2) EW	(3) Baseline	(4) EW	(5) Baseline	(6) EW	(7) Baseline	(8) EW	(9) Baseline	(10) EW
	Cambodia		**Cameroon**		**Congo**		**DRC**		**Ivory Coast**	
Total children	-1.74***	-1.16***	-2.73***	-1.92***	-1.51***	-1.05***	-1.45***	-0.89**	-1.83***	-1.14***
	(0.32)	(0.29)	(0.23)	(0.36)	(0.25)	(0.23)	(0.25)	(0.30)	(0.22)	(0.25)
N	414	414	426	426	403	403	405	405	406	406
R-Squared	0.43	0.52	0.51	0.59	0.85	0.69	0.67	0.59	0.64	0.57

Panel B.	(1) Baseline	(2) EW	(3) Baseline	(4) EW	(5) Baseline	(6) EW	(7) Baseline	(8) EW	(9) Baseline	(10) EW
	Mali		**Morocco**		**Senegal**		**Turkey**		**Vietnam**	
Total children	-2.36***	-1.38***	-0.58***	-0.24	-1.65***	-1.17***	-0.04	-0.45**	-0.99***	-0.65***
	(0.31)	(0.40)	(0.17)	(0.16)	(0.23)	(0.27)	(0.16)	(0.16)	(0.16)	(0.18)
N	380	380	620	620	455	455	575	505	469	469
R-Squared	0.64	0.65	0.42	0.48	0.54	0.66	0.38	0.44	0.31	0.41

Panel C.	(1) Baseline	(2) EW	(3) Baseline	(4) EW	(5) Baseline	(6) EW	(7) Baseline	(8) EW	(9) Baseline	(10) EW
	Cambodia		**Cameroon**		**Congo**		**DRC**		**Ivory Coast**	
Ideal family size	-0.99***	-0.67***	-3.01***	-1.64***	-2.16***	-2.23***	-2.20***	-2.05***	-1.98***	-1.30***
	(0.18)	(0.17)	(0.28)	(0.25)	(0.23)	(0.30)	(0.51)	(0.38)	(0.19)	(0.23)
N	400	400	384	384	368	368	377	377	366	366
R-Squared	0.51	0.33	0.37	0.45	0.75	0.49	0.48	0.41	0.35	0.38

Panel D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

	Baseline	EW	Baseline	EW	Baseline	EW	Baseline	EW	Baseline	EW
	Mali		**Morocco**		**Senegal**		**Turkey**		**Vietnam**	
Ideal family size	-2.90***	-2.13***	-0.12	-0.00	-2.12***	-1.70***	0.25	0.55*	0.06	0.06
	(0.32)	(0.39)	(0.14)	(0.11)	(0.28)	(0.29)	(0.16)	(0.21)	(0.10)	(0.12)
N	307	307	597	597	363	363	485	485	462	462
R-Squared	0.56	0.47	0.21	0.22	0.31	0.40	0.08	0.14	0.28	0.26

Controls include education and number of siblings (with the exception of Vietnam where number of siblings is not available.

Differences in sample sizes within countries across outcomes reflect missing values for the outcomes.

Table 4. Linear predictions of factors predicting total children born and ideal family size among migrant sample in France. Weighted using sampling weights provided by TEO.

	(1) Total children	(2) Ideal family size
Age arrive 16-25 (ref=<16)	0.64***	0.27*
	(0.15)	(0.12)
Age arrive 26+ (ref=<16)	0.38	0.35
	(0.23)	(0.19)
Arrived 10-20 yrs ago (ref=<10)	0.27	0.32*
	(0.14)	(0.14)
Arrived 20+ yrs ago (ref=<10)	0.45*	0.42*
	(0.22)	(0.18)
Feels French	-0.28**	-0.24*
	(0.10)	(0.10)
Regulalry uses media from origin country	0.49***	0.31**
	(0.10)	(0.10)
Regularly visits origin country	0.06	0.00
	(0.07)	(0.08)
Constant	0.23	1.77***
	(0.77)	(0.43)
Observations	1,667	1,559
R-squared	0.41	0.13

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Age and country FE not shown.

Appendix Table 1. Information about data source, year region, and Total Fertility Rate (TFR)

Region	Country	Source	Years	TFR
Europe	France	TEO	2008/09	2.01
Central Af.	Congo (Brazzaville)	DHS	2005, 2011/12	4.75
Central Af.	Congo (DRC)	DHS	2007	6.65
West Af.	Cameroon	DHS	2004, 2011	5.2
West Af.	Ivory Coast	DHS	2011/12	5.03
West Af.	Mali	DHS	2006	6.76
West Af.	Senegal	DHS	2005, 2010/11	5.11
MENA	Morocco	DHS	2003/04	2.63
MENA	Turkey	DHS	2008	2.19
SE Asia	Cambodia	DHS	2005/06, 2010/11	3.05
SE Asia	Vietnam	DHS	2002	1.9

Data on TFR from the World Bank (for countries with more than one survey year the TFR was the averge of both years).