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Research Article

**Co-ethnic marriage versus intermarriage among
immigrants and their descendants:
A comparison across seven European countries using
event-history analysis**

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Co-ethnic marriage versus intermarriage among immigrants and their descendants: A comparison across seven European countries using event-history analysis

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Abstract

BACKGROUND

Immigrants and their descendants often marry a co-ethnic partner despite the abundance of native-born marriage candidates. The prevalence of co-ethnic marriages and intermarriage among migrants is influenced by their integration level and cultural background as much as individual preferences and structural factors.

OBJECTIVE

This paper expands existing literature on intermarriage by analysing first marriages across European countries, distinguishing marriage type (endogamous versus exogamous) and migrant generations (immigrants versus their descendants).

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METHODS

Data from seven countries was aggregated using the count-data method and was subsequently pooled and analysed together; first, to estimate unadjusted first marriage rates; second, to calculate marriage risks separately by marriage type; and, finally, to directly compare the risk of exogamous and endogamous marriage.

RESULTS

There are substantial differences in the prevalence of co-ethnic marriage and intermarriage across the migrant groups. Migrants from non-EU countries often show a high prevalence of co-ethnic marriages and a low risk of intermarriage, whereas migrants from neighbouring countries show a relatively high risk of intermarriage.

CONCLUSIONS

Ethnic background and early socialisation have strong impacts on the partner choice of migrants and their descendants. The results suggest a strong influence of minority subcultures for some migrant groups, but also intergenerational adaptation processes for others.

CONTRIBUTION

This paper provides an up-to-date comparison of intermarriage rates across seven European countries and two migrant generations, presenting evidence of both similarities and differences across countries.

1. Introduction

Many European countries have experienced an increase in their foreign-born population and ethnic minorities over the past decades (Andersson, Obućina, and Scott 2015; Zimmermann 2005). However, the scale of immigration, the origin of immigrants, and the experience with cultural integration varies greatly across European countries and respective migrant groups. The lives of immigrants and their descendants in Europe are the topic of a large body of empirical literature that focuses on the fertility and family behaviour of immigrants and, more recently, of their descendants as well (Coleman and Dubuc 2010; Goldscheider, Goldscheider, and Bernhardt 2011; Kulu and Hannemann 2016; Toulemon 2004; Kulu et al. 2017). The current study contributes to this strand of research, analysing the formation of first marriages and distinguishing between intermarriage (exogamous) and co-ethnic (endogamous) partner choice comparatively across seven European countries: the United Kingdom, France, Belgium, Switzerland, Estonia, Romania, and Spain.

Many studies aim to identify and explain differences in demographic behaviour across various migrant groups as well as in comparison with the native population. A

high level of intermarriage between foreign and native individuals is interpreted as an indicator of general acceptance of immigrants by the majority population, and vice versa (Alba and Nee 2003; Coleman 1994; Feng et al. 2012; Kalmijn 1998). As individuals generally search for a partner with similar sociocultural characteristics (Becker 1973, 1974), marriage between a native individual and a foreign-born individual can also be viewed as an indicator of successful integration (Dribe and Lundh 2008; Furtado 2012). However, high levels of exogamy may also be the result of inherently lower cultural and socioeconomic distance between certain migrant groups and the respective native population, as is the case of migration between neighbouring countries that share historic, economic, and social bonds. The level and stability of intermarriage (e.g., mixed ethnic origins) and co-ethnic marriages (e.g., shared ethnic background) have been analysed in several European countries (Dribe and Lundh 2012; González-Ferrer 2006b; Kalmijn and Van Tubergen 2006; Milewski and Kulu 2014). However, given the importance of inter-ethnic unions as an underlying mechanism and indicator of integration, it is surprising that the topic has received limited attention in a comparative perspective, especially in Europe.

In the same way as migration history and the share of foreign-born individuals vary across European countries, government-supported integration strategies and cultural differences between foreign and native populations also differ between countries (Bail 2008; Freeman 2004). Therefore, an analysis of the prevalence of co-ethnic marriage and intermarriage across various migration groups in several European countries could provide valuable insights for policymakers shaping future migration, integration, and family policies.

The aim of this study is to examine differences in the prevalence of mixed marriages among immigrants and their descendants groups in seven European countries. The study extends previous literature in several ways. First, this is one of the first studies to compare mixed marriage risks across a number of European countries, as only a few previous studies on this topic use a comparative approach (Lanzieri 2012). Furthermore, existing research on exogamy focuses primarily on Western European countries. The sample in this study covers a wider range of European countries that includes Eastern European countries and therefore provides a more holistic perspective on endogamy and exogamy in contemporary Europe. The first research question is how the risk of co-ethnic marriage and intermarriage varies across migrant groups within and between the seven countries.

Second, the study investigates immigrants' and their descendants' propensity to choose a partner of the same or of a different ethnic background. The inclusion of both immigrant generations provides an insight into intergenerational changes in partner choice. The second research question is: To what extent does the risk of intermarriage change between the first and the second generation of immigrants?

Finally, separate analyses are conducted for men and women, to measure possible gender differences in the effect of individual characteristics such as age and education. Therefore, the third and last research question is whether the risk of co-ethnic marriage and intermarriage varies between men and women across migrant groups, controlling for important socioeconomic characteristics. In summary, this study will broaden our understanding of the variation in intermarriage among immigrants and their descendants across seven European countries.

2. Theoretical framework

Explanations of intermarriage trends combine theoretical approaches from a wide range of research fields (for an overview, see Adserà and Ferrer 2014). Furthermore, a complex set of explanations touching different levels of social interaction have to be considered when interpreting intermarriage trends. As marriage is intended to be a life-long bond, a partner is typically chosen with much care, and the choice reflects a combination of individual preferences (micro-level explanation) and contextual opportunities (macro-level explanation) (González-Ferrer 2006a; Kalmijn 1998). This paper is limited to the analysis of first marriage. Cohabitation as an alternative union type is often seen as an indicator of modern family values and has spread among the native populations of many European countries, especially as the first union (Hiekel, Liefbroer, and Poortman 2014; Lesthaeghe 2010). A comparative investigation of endogamous and exogamous unions other than marriage, such as cohabitation, or of higher order marriages would therefore be of great interest. Unfortunately, data on non-traditional union types is rare and often incomplete.

2.1 Individual-level factors in intermarriage

In addition to physical attraction, in their partner selection criteria individuals strongly prefer similarity in terms of socioeconomic position and shared cultural values (Kalmijn 1998). The dominant trend of marital partner choice, positive assortative mating, is viewed as a natural consequence of searching for a similar partner. In regard to immigrants, especially those from culturally distant origins such as non-EU countries, marital endogamy is an expected consequence due to the socioeconomic and cultural differences between them and the native population (Dribe and Lundh 2011). Several outcomes are possible for descendants of immigrants who grew up experiencing the cultural heritage of their parents at home but surrounded by the cultural expressions of the native population. In families that have largely adopted the native culture, the

descendants will tend to follow native trends and consider natives as marriage partners equivalent to members of their own ethnic origin. Alternatively, if descendants of immigrants grow up mainly under the impact of the minority subculture (cultural enclave predominantly influenced by the ethnic background of its members) and isolated from native influences, it is possible that their family formation decisions will relate very closely to those of their parents. Adherence to traditional marriage patterns may be a way of compromising and gaining independence in other life domains.

The level of human capital is another important individual-level factor. Previous research in the Netherlands finds a higher likelihood of exogamy among immigrants with a higher education level (Kalmijn and Van Tubergen 2006; Van Tubergen and Maas 2007). These results are supported by the analysis of post-war immigrants in France (Hamel and Moisy 2013; Safi 2010). Furthermore, high exogamy rates are found among individuals with better native language skills. Therefore, the wish for a partner with a similar socioeconomic status can outweigh the preference for a co-ethnic partner.

Merton's status exchange theory is a different approach to human capital in the marriage market and explains the phenomenon of intermarriage as an exchange of valuable human, social, or economic assets between the two parties (Merton 1941; Qian and Lichter 2007). A highly educated immigrant can offer economic stability while receiving access to native social and cultural capital (which would otherwise be harder to accomplish) through his/her native spouse (Behtoui 2010; Meng and Gregory 2005). In the opposite case, low-educated native men with few economic resources might marry migrant women because they have few prospects in the native marriage market, given the tendency for men to marry downwards and women to marry upwards in regards to socioeconomic status. However, status exchange theory has received mixed empirical support in the United States (Gullickson 2006; Rosenfeld 2010). Although socioeconomic status is an important factor that influences mating choices, it is not the only exchangeable individual trait. Economic resources, physical appearance, and younger age can also be used as bargaining tools. It can be expected that there are differences in the distribution and use of socioeconomic status and human capital as assets to attract a partner for both sexes, as well as across the various immigrant groups and countries.

Although those bargaining assets would work in similar ways for both migrant generations, the second-generation has the advantage of being more familiar with the native language and customs during the period of searching for a marriage partner, due to their upbringing in the destination country. This could explain the higher prevalence of intermarriage among the second generation compared to the first generation. This study includes individual education level to account for the impact of socioeconomic status on intermarriage trends. Although the inclusion of the individuals' income, wealth, or occupation would be desirable, education is the best single measure of

socioeconomic status in the absence of comparable information on other socioeconomic characteristics.

2.2 Structural constraints and opportunities for intermarriage

The operation of individual factors is often supported or hindered by the structure of the local marriage market. Exogamy as a result of structural limitations in the marriage market is explained by the structural opportunity theory (Blau 1977; Cretser 1999). A limited availability of matching partners with preferred characteristics within the own migrant group can influence and consequently alter individual preferences. Such structural limitations in the marriage market can occur due to small migrant group size, an unbalanced sex ratio, limited residential proximity, unfavourable age structure, etc.. A higher level of exogamy would therefore be expected among very small migrant groups, independent of cultural distance (Chiswick and Houseworth 2011; Coleman 1994; González-Ferrer 2006a). Because the focus of this study is a multi-country comparison of immigrants and their descendants, the sample contains only the largest migrant groups in each country, thus substantially reducing the impact of such structural limitations. Given the focus of this study and the choice of migration groups, it will not test any hypothesis regarding structural constraints on intermarriage.

2.3 Cultural factors, assimilation, and integration

Besides the aforementioned factors, cultural and normative factors also impact partner choice. These factors are specific to each migrant group or ethnic community. Some of the most studied cultural factors of intermarriage are religion and religiosity, since different religious beliefs are often associated with larger cultural distance between people (Carol 2013). Previous studies have shown that exogamy is higher among European immigrants whose culture and faith is similar to those of Western European countries (Lucassen and Laarman 2009), whereas it is lower for immigrants with more distant religious and cultural backgrounds (Kalmijn and Van Tubergen 2006).

The prevalence of intermarriage between immigrant and native individuals is often associated with a high level of integration of specific migrant groups in the host society (Gordon 1964; Kulu and González-Ferrer 2014). Well-integrated immigrants would be considered as equals and present an alternative to natives in the marriage market. However, high levels of exogamy may have causes other than the successful integration of the foreign-born population (Song 2009). A similar culture, language, and behavioural code could be enough to dilute perceived migrant differences.

The classical assimilation/adaptation theory states that immigrants will integrate into the host society with time (Gordon 1964), which could increase their propensity for intermarriage over time. Longer time of exposure to the host society will promote the acculturation process, integration into labour and marriage markets, and the accumulation of country-specific human and economic capital such as language skills, residence permits, and social ties. Although many immigrants will ultimately spend many years and decades in the destination country, depending on their age at arrival they may have chosen a partner from their origin country before migrating, or search for a matching partner shortly after arrival with little exposure to the destination country. Unlike their parents, descendants of immigrants spent their childhood in the host society. If their parents are well integrated into the host society, the descendants should have relatively unrestricted access to the native marriage market and therefore show high levels of marriages with a native partner (Clark-Ibáñez and Felmler 2004; Van Niekerk 2007). However, several studies have found that second-generation immigrants from some origins have very low levels of exogamy, mostly following their parents' partner-choice pattern. This behaviour could be explained by the socialisation theory, which states that preferences for life course decisions are established early in life and are heavily influenced by the cultural system of the country of origin (Hervitz 1985; Kulu and Milewski 2007). For descendants of immigrants who are raised in highly segregated environments under the influence of the ethnic minority subculture, the socialisation effect could be transferred between the generations and lead to low exogamy levels. To determine whether there are inter-generational changes in the preference for co-ethnic or mixed-ethnic first marriages, this study examines groups of immigrants and their descendants separately by origin.

Finally, the mechanisms of bargaining power and desirable assets in the marriage market will vary between men and women, given the aforementioned tendency for upward marriage among women and downward marriage among men. Possible interaction effects between migrant group, gender, and education increase the complexity of the analytical model. Therefore, this study analyses men and women separately, which is essential to shed light on the interaction effects of individual demographic, cultural, and economic characteristics (Nikiforov and Mamaev 1998).

3. Data

3.1 Included countries and sampling

This study uses data from seven European countries: the United Kingdom, France, Belgium, Switzerland, Estonia, Romania, and Spain. Prior to this study, five country

case studies have been conducted that provide detailed analysis of inter-ethnic partnership in the United Kingdom, Spain, Estonia, Switzerland, and Romania (González-Ferrer et al. 2016; Hărăguș 2016; Kulu and Hannemann 2018; Potârcă and Bernardi 2018; Puur et al. 2018), which inspired the idea for this comparative paper. In order to make this paper even more representative of the European context, further research partners from France and Belgium were recruited to participate in this study.

Data for the United Kingdom is derived from the first wave (2009/2010) of the *Understanding Society* study (University of Essex, Institute for Social and Economic Research, and NatCen Social Research 2014), which collected detailed information on partnership histories. For France, this study uses data from the *Trajectories and Origins* survey (TeO), which was conducted in 2008 by the French Institute for Demographic Studies (INED) and the French National Statistical Office (INSEE). The survey contains retrospective information on partnership formation, including the country of birth for marital partner.

The Romanian data was taken from a replication of the first wave of the Generations and Gender Survey (GGS) in combination with the Hungarian *Turning Points of Our Life Course* panel survey in 2006. The information focuses on the ethnic Hungarian population in the region of Transylvania and contains retrospective partnership information, including the ethnic background of each partner. In the case of Switzerland, data from the Family and Generations Survey (originally *Enquête sur les familles et les générations* (EFG) 2013) is used. This survey was conducted by the Federal Statistical Office as part of the new census of the Swiss population. Among other factors, the EFG survey collected information on the individual's current marriage and retrospective information on marital union history.

Estonian data was retrieved from two retrospective studies: The Estonian Generations and Gender Survey (2004/2005) and the Estonian Family and Fertility Survey (1994). For Belgium, this study uses data from the 2001 Census, which contains retrospective information on the first marriage of women, including the ethnicity of the partner. For Spain, this study exploits data from the 2007 National Immigrant Survey (NIS), which was conducted by the Spanish National Institute of Statistics.

In this study, immigrants are defined as individuals who were born outside of their current country of residence (with the exception of ethnic Hungarians in Romania). Their native-born children are therefore defined as descendants of immigrants. Apart from native-born children with two foreign-born parents, the latter group also includes individuals with one foreign-born and one native parent (they amount to only very small case numbers and therefore could not be analysed separately).

Overall, a co-ethnic or endogamous marriage is defined as a marriage between individuals with the same ethnic background (country of birth for immigrants and ethnic origin for descendants of immigrants). This definition includes the marriage of

individuals from the same ethnic background but different migrant generations. For example, the marriage between an immigrant from Turkey and a native-born descendant of Turkish parents is categorised as an endogamous marriage in this study. As a result, an intermarriage is defined as a marriage between individuals of different ethnic backgrounds. The majority of these are unions between a native individual and a person from an ethnic minority. (The rare cases of intermarriage between immigrants or descendants of different ethnic backgrounds could not be analysed separately in this study due to very small case numbers).

Furthermore, several countries of origin had to be aggregated for the purpose of robust statistical analysis due to small numbers in specific migrant origin groups. In those cases, the specific combination of the country of origin of the individual and his/her partner remains the indicator for distinguishing endogamous from exogamous marriages. For example, although both partners of a French-Spanish couple might belong to the aggregated group of Western Europe, their marriage is defined as intermarriage because their specific countries of birth still differ. For Romania, the differentiation between the two types of marriage is done solely on the basis of self-reported ethnicity, due to the fact that country of birth is the same for the Romanians and the ethnic Hungarians.

In total, this study distinguishes between thirty-six individual migrant groups. As Table 1 shows, the UK data differentiates between four groups of origin for both immigrant generations: (1) Europe and other industrialised countries (referred to as Europe and West), (2) India, (3) Pakistan and Bangladesh, and (4) Caribbean countries. For France, immigrants and their descendants from the following origins are investigated: (1) Maghreb states, (2) sub-Saharan African countries, (3) Turkey, and (4) Southern Europe. For Switzerland, immigrants and their descendants are classified into three groups: (1) former Yugoslavia and Turkey, (2) Germany, France, and Austria (referred to as Western Europe), and (3) Southern Europe. Immigrants and their descendants in Estonia consist of individuals from Russia, Ukraine, and Belarus (referred to as Russian-speaking).

The Romanian data source focuses on the ethnic Hungarians in Transylvania, who represent the largest minority group in the country. The main groups of origin for the first- and second-generation immigrants in Belgium are: (1) Italy, (2) Morocco, and (3) Turkey. Spain contributes to this sample with first-generation immigrants only, from seven different origins: (1) Morocco, (2) Romania, (3) Ecuador, (4) Colombia, and (5) countries of the EU25 region. In order to increase clarity in figures and tables, the remainder of the study will refer to immigrants as 1G and to descendants of immigrants, the so-called second generation, as 2G, in combination with the respective ethnic minority name.

Given the comparative nature of this study and the harmonisation process between the different data sources, only the most important demographic and socioeconomic confounders could be included. This study analyses time until first marriage using age as the baseline, categorised into five-year age groups (15–19; 20–24; 25–29; 30–34; 35 and older). Individuals become at risk of marriage at their 15th birthday. Legal age for marriage varies across the seven countries analysed here, as well as among the various countries of origin. For immigrants who arrived in the country of destination at later ages, risk time also includes time spent in the country of origin. Therefore, the start age is set early deliberately in order to capture young age marriages in some migrant groups. Rare cases where an individual stated that s/he married before the age of 15 were removed from the sample. Individuals are censored at the age of 45 in cases where no first marriage was recorded.

Our research sample consists of women and men born between 1950 and 1989, grouped into four 10-year birth cohorts. The analysis includes highest achieved education level as an indicator of socioeconomic status. Information on education level is treated as a time-constant variable and was measured at the time of the interview. Education is categorised into low, medium, and high levels of achieved educational degree (ISCED (1997) levels 0–2, 3–4, and 5–6, respectively). Some countries had missing information on education level, which was introduced as an additional category in order to avoid unnecessary reduction in the sample size.

Table 1 provides the size of the risk population and the number of events (first marriage) and person-months for each of the seven countries, disaggregated by migrant group, migrant generation, and sex.

Table 1: Number of individuals, events, and risk-time by country, migrant group, and sex

	Women Number of individuals	Person- months at risk	First marriage	Men Number of individuals	Person- months at risk	First marriage
United Kingdom						
1G Europe and West	499	81,193	260	369	62,333	159
2G Europe and West	428	79,449	208	400	78,376	209
1G India	333	38,118	281	398	56,234	255
2G India	235	33,366	129	214	33,179	98
1G Pakistan and Bangladesh	519	43,401	475	600	80,219	447
2G Pakistan and Bangladesh	271	26,581	132	212	24,882	91
1G Caribbean	140	33,834	46	89	22,364	32
2G Caribbean	290	72,323	66	197	46,018	51
All	2,715	408,265	1,597	2,479	403,605	1,342
France						
1G Maghreb	1,005	121,084	848	909	151,139	721
2G Maghreb	1,262	163,654	607	987	145,535	317
1G Sub-Saharan Africa	352	54,324	277	372	72,175	263
2G Sub-Saharan Africa	257	28,256	49	263	29,747	33
1G Turkey	359	27,694	324	427	46,896	366
2G Turkey	207	17,089	104	188	18,622	66
1G Southern Europe	610	75,707	514	572	89,289	461
2G Southern Europe	1,269	192,070	634	1,228	209,671	506
All	5,321	679,877	3,357	4,946	763,073	2,733
Belgium						
1G Italy	1,402	157,549	1,159			
2G Italy	1,915	202,815	547			
1G Morocco	1,446	135,425	1,289			
2G Morocco	871	63,539	260			
1G Turkey	1,061	70,651	992			
2G Turkey	465	26,354	208			
All	7,160	656,333	4,455			
Switzerland						
1G Southern Europe	305	41,004	262	328	54,876	270
2G Southern Europe	354	59,244	266	351	67,404	232
1G For. Yugoslavia and Turkey	139	17,400	122	180	23,952	167
2G For. Yugoslavia and Turkey	98	12,672	70	113	16,080	53
1G Western Europe	339	63,660	218	271	57,228	179
2G Western Europe	150	29,688	99	98	18,780	70
All	1,385	223,668	1,037	1,341	238,320	971
Estonia						
1G Russian speaker	812	70,609	720	384	42,603	332
2G Russian speaker	967	80,287	711	642	72,345	403
All	1,779	150,896	1,431	1,026	114,948	735
Romania						
Ethnic Hungarian	1,272	144,763	836	1,172	176,370	623
Spain						
1G Morocco	575	65,604	427	825	130,896	498
1G Romania	601	65,460	365	548	70,872	304
1G Ecuador	509	73,560	223	481	71,796	198
1G Colombia	505	92,664	219	270	46,176	102
1G EU25	1,515	224,844	780	1,302	218,616	602
All	3,705	522,132	2,014	3,426	538,356	1,704

Source: Authors' own calculation based on data from surveys and censuses from seven countries; for more details see data section.

Note: 1G (1st generation) refers to immigrants, whereas 2G (2nd generation) refers to their descendants

3.2 Country-specific and harmonisation limitations

Despite our efforts to assure the highest level of comparability across the countries in this study, several exceptions regarding availability of data and definitions have to be taken into account when interpreting the results. First, in Belgium, where the census only provides data on first marriage for women aged 14 years and older, no analysis could be performed for men.

Second, due to the retrospective nature of the data from Belgium, the United Kingdom, and Spain, not all married individuals could be included in the sample. For Belgium and the United Kingdom, information on the partner's country of birth was only available for current marriages at the time of the survey or census. First marriages which had ended by the time of the interview were excluded from this analysis because their type could not be determined. In Spain all married individuals are included in the analysis; however, since the marriage order cannot be established from the survey, it is not certain that all marriages are first marriages. Given the relatively young immigrant population and the low divorce and remarriage rates in Spain, this should only introduce minor bias to the analysis.

Third, for Spain this study only analyses immigrants, because for most migrant groups the second generation has not yet reached marriage age. The case of Romania is different. The indigenous ethnic Hungarians in Transylvania are not immigrants: this ethnic minority group formed through territorial changes and political transformations after the First World War. Although these individuals did not undergo a migration process they still are a distinct minority in Romania, which lives in geographically separate areas (54% of them live in localities where they account for more than 50% of the population (Tamás and Ilka 2010)), is schooled in the Hungarian language, and uses their native language at home and in the cultural community, comparable to migrant groups. This is the reason why in this study this group is analysed together with migrant groups from other countries. Furthermore, information on ethnic Hungarians in Romania was available only from birth cohort 1960 onwards. However, sensitivity analysis, using only the cohort range of 1960–1989 for all countries, showed no significant differences in the results.

4. Methods

Comparing seven European countries, the count-data approach is used to investigate the relative risk of co-ethnic marriage and intermarriage (Hoem 1987, 1993; Hoem et al. 1976). This approach aggregates data over a chosen set of individual characteristics and is the preferred option in circumstances where individual-level data cannot be shared

with another research group due to data protection. The count-data approach can be used to compare marriage rates across population subgroups and countries with and without standardising the rates to individual characteristics. An event-time (or occurrence-exposure) table for each country is prepared, which is defined by a cross-classification over a set of time intervals (in this study, 5-year age groups) and covariate categories (Preston 2005). The data for each cell in such a table includes the total number of events and the total time at risk for each combination of covariate categories. For each cell, the ratio of the number of marriages to the number of person-months spent at risk is a crude hazard:

$$\lambda_{jk} = E_{jk}/R_{jk}, \quad (1)$$

where λ_{jk} is the hazard for category k in time period j . Let E_{jk} denote the number of first marriages and R_{jk} denote the number of person-months at risk for group k in age group j . Therefore, E_{jk} is treated as the realisation of a Poisson random variable with the mean μ_{jk} :

$$\mu_{jk} = \lambda_{jk} \times R_{jk}. \quad (2)$$

Thus, the product of the hazard of first marriages and exposure time is the expected number of marriages. The model can be presented in a log-linear format:

$$\ln \mu_{jk} = \ln \lambda_{jk} + \ln R_{jk}. \quad (3)$$

The equation is then arranged to investigate the hazard of type of first marriage:

$$\ln(\mu_{jk}/R_{jk}) = \ln \lambda_{jk}. \quad (4)$$

Finally, Equation 5 presents a log-linear model for the hazard of first marriage while including additional covariates:

$$\ln \lambda_{jk} = \alpha_j + x'_k \beta_k, \quad (5)$$

where α_j reflects the log baseline hazard function of first marriage in terms of age, x'_k is a covariate matrix, and β represents a vector of the parameters measuring their effects. Both types of marriage (endogamous and exogamous) are treated as competing risks, with an individual being censored for one type of marriage in the case that the alternative event occurs. Those two competing risks lead to the following model:

$$\begin{aligned}\ln \lambda_{jk}^A &= \alpha_j^A + x_k' \beta_k^A \\ \ln \lambda_{jk}^B &= \alpha_j^B + x_k' \beta_k^B.\end{aligned}\tag{6}$$

Data from each country was aggregated using the different combinations of age, birth cohort, education, and ethnic group, and subsequently pooled into one common database. Marriage risk was analysed using a Poisson regression model (6) distinguishing between the competing outcomes of endogamy (*A*) and exogamy (*B*), while considering the impact of the sociodemographic confounders. In a second step the degree of exogamy and endogamy among the various migrant groups was analysed simultaneously. For this step an interaction term of migrant group and marriage type was used with only one overall reference group (second-generation Indians in the United Kingdom). This method provides the opportunity to compare the risk of endogamy and exogamy directly across the large number of migrant groups and countries, instead of running separate analyses for both types of marriage.

5. Results

5.1 Descriptive statistics

Table 2 presents unadjusted rates per 1,000 person-months for all marriages, disaggregated for co-ethnic marriages and intermarriage. The rate ratios, calculated as the ratio of co-ethnic marriages to intermarriages, suggest that the dominant pattern is ethnic endogamy. Among 36 migrant groups of women, 27 demonstrate rate ratios that exceed one, implying higher endogamous marriage rates. For men, the higher propensity for endogamous marriages is even more pronounced. Furthermore, the patterns observed for immigrants are often reproduced by their descendants, which could suggest either a strong impact of the minority subculture or a lack of socioeconomic mobility. However, we also observe certain changes between the migrant generations, including a lower prevalence of endogamy in the second generation.

The rate ratios show large variation depending on migrant group and country of destination. The highest ratio of endogamous to exogamous marriages is observed among women from Turkey in Belgium and France and those from Pakistan and Bangladesh in the United Kingdom, groups with large geographical and cultural distance between country of origin and destination. The lowest rate ratio is observed for most European women and their descendants across all countries and descendants of sub-Saharan African migrants in France. It can be assumed that at least for the European immigrants and their descendants, cultural differences between country of

origin and destination are small, which could facilitate access to the native marriage market.

Table 2: Unadjusted rates for endogamous and exogamous first marriages by migrant group and sex (per 1,000 person-months)

	Women All marriages	Endo- gamous	Exo- gamous	Rate ratios	Men All marriages	Endo- gamous	Exo- gamous	Rate ratios
United Kingdom								
1G Europe and West	3.2	1.0	2.2	0.4	2.6	1.0	1.6	0.6
2G Europe and West	2.6	0.2	2.4	0.1	2.7	0.2	2.4	0.1
1G India	7.4	6.1	1.3	4.9	4.5	4.0	0.5	8.1
2G India	3.9	2.3	1.5	1.5	3.0	1.6	1.3	1.2
1G Pakistan and Bangladesh	10.9	10.2	0.7	14.3	5.6	5.2	0.3	15.0
2G Pakistan and Bangladesh	5.0	4.4	0.5	8.4	3.7	3.1	0.6	5.5
1G Caribbean	1.4	0.9	0.5	1.7	1.4	1.2	0.3	4.3
2G Caribbean	0.9	0.5	0.4	1.2	1.1	0.6	0.5	1.1
France								
1G Maghreb	7.0	5.9	1.1	5.3	4.8	3.5	1.3	2.7
2G Maghreb	3.7	2.3	1.4	1.7	2.2	1.1	1.1	1.0
1G Sub-Saharan Africa	5.1	3.3	1.8	1.8	3.6	2.3	1.4	1.7
2G Sub-Saharan Africa	1.7	0.3	1.4	0.2	1.1	0.2	0.9	0.2
1G Turkey	11.7	11.2	0.5	23.9	7.8	7.0	0.8	8.9
2G Turkey	6.1	5.4	0.6	8.5	3.5	2.9	0.6	4.5
1G Southern Europe	6.8	3.6	3.1	1.2	5.2	2.7	2.4	1.1
2G Southern Europe	3.3	0.6	2.7	0.2	2.4	0.5	2.0	0.2
Belgium								
1G Italy	7.4	4.3	3.1	1.4				
2G Italy	2.7	1.0	1.7	0.6				
1G Morocco	9.5	8.6	1.0	8.8				
2G Morocco	4.1	3.6	0.5	7.7				
1G Turkey	14.0	13.5	0.5	25.1				
2G Turkey	7.9	7.2	0.7	10.6				
Switzerland								
1G Southern Europe	6.4	5.0	1.4	3.6	4.9	3.6	1.3	2.7
2G Southern Europe	4.5	2.0	2.5	0.8	3.4	1.1	2.3	0.5
1G For. Yugoslavia and Turkey	7.0	4.6	2.4	1.9	7.0	4.8	2.2	2.2
2G For. Yugoslavia and Turkey	5.5	3.9	1.7	2.3	3.3	2.2	1.1	1.9
1G Western Europe	3.4	1.6	1.8	0.9	3.1	1.9	1.2	1.6
2G Western Europe	3.3	0.2	3.1	0.1	3.7	0.1	3.7	0.0
Estonia								
1G Russian speaker	10.2	8.9	1.3	6.7	7.8	7.0	0.8	8.5
2G Russian speaker	8.9	7.6	1.2	6.3	5.6	5.1	0.5	10.5
Romania								
Ethnic Hungarian	5.8	5.0	0.8	6.7	3.5	3.0	0.6	5.1
Spain								
1G Morocco	6.5	5.1	1.4	3.5	3.8	3.0	0.8	3.7
1G Romania	5.6	5.1	0.5	9.7	4.3	4.1	0.2	22.4
1G Ecuador	3.0	2.5	0.5	5.2	2.8	2.6	0.1	21.0
1G Colombia	2.4	1.2	1.1	1.1	2.2	1.7	0.5	3.3
1G EU25	3.5	0.7	2.8	0.3	2.8	0.5	2.3	0.2

Source: Authors' own calculation based on data from surveys and censuses from seven countries; for more details see data section.
Note: 1G (1st generation) refers to immigrants, while 2G (2nd generation) refers to their descendants. Rate Ratios are calculated as the ratio of endogamous over exogamous rates per 1,000.

For men, the analysis shows a similar pattern with similar or more moderate variations of rate ratios across the migrant groups. Compared to women, high rate ratios are additionally found for the migrant groups in Estonia and immigrants from Romania and Ecuador in Spain. Men from other European countries and their descendants show a very low propensity for co-ethnic marriages. Overall, marriage rates are lower for men than for women, which can be explained by the age difference between husbands and wives at time of marriage, which is common to most countries and cultural backgrounds.

The Russian-speaking migrants in Estonia show elevated marriage rates, which can be explained by the relatively early ages of first marriage in Eastern European countries. On the contrary, both generations of Caribbeans in the United Kingdom and second-generation sub-Saharan Africans in France show the lowest overall marriage rates in this seven-country comparison, a trend shared by both sexes. These can be explained by cultural differences in the meaning and importance of marriage for family formation processes (Hannemann and Kulu 2015; Miner 2003). Other forms of partnership, as well as separations and re-partnering, are more common among those ethnic groups.

5.2 Separate analysis of co-ethnic marriage and intermarriage

Table 3 shows the results of the competing risk models of endogamous and exogamous first marriages for men and women. The models control for age, birth cohort, education, and migrant group across the seven countries. Because of their moderate position in the range of rate ratios in Table 2, the descendants of Indian immigrants in the United Kingdom serve as the reference category for these models.

Looking at the various migrant groups, large differences can be found in the competing risks of co-ethnic marriage and intermarriage. These differences persist even after controlling for socioeconomic characteristics, which themselves have strong effects, as shown above. The highest endogamous marriage risks are still observed for first-generation Pakistani and Bangladeshi in the United Kingdom, first-generation Moroccans and first- and second-generation Turks in France, Russian-speakers in Estonia, and first- and second-generation Turks and Moroccans in Belgium. The second-generation Turks in France show an early entry into their first union, which in the majority of cases is a marriage (Milewski and Hamel 2010; Pailhé 2015). The separate analysis by marriage type shows that the early marriage pattern is present for endogamous marriage, whereas lower relative marriage risks among those marrying outside their ethnic group hint at a later entry into marriage. Similar tempo differences between the marriage types can be observed for the second-generation Turkish in

Belgium and the second-generation Pakistani and Bangladeshi in the United Kingdom, two groups with overall early entry into marriage, following their parent's union formation patterns (Hannemann and Kulu 2015; Lievens 1999).

Many of the migrant groups in Spain show medium-range unadjusted marriage rates, some countries show a higher propensity for endogamous marriage (Morocco, Romania, and Ecuador), some countries having equal rates (Colombia), and the EU 25 countries have higher intermarriage rates. When compared to the reference category in the regression model the relative rates are reduced for both types of marriage, although the predisposition for one or the other marriage type remains. Stepwise-inclusion models (not shown here) demonstrate that the reduction of coefficients is explained by the comparative setting rather than the impact from the covariates.

In the model for intermarriage the highest relative risks are found for European immigrants across all countries, with slight differences between the migrant generations. In Belgium, for instance, we find that the first-generation Italians have considerably higher intermarriage rates than their descendants, while in Switzerland the second-generations from Southern and Western Europe show higher intermarriage rates than their parent's generation. This result supports the notion that in different countries the second generations experiences different degrees and kinds of integration.

In most cases, the results for men follow the trends and patterns observed for women. As shown above, larger differences were found for the socioeconomic covariates between the sexes, which supports our decision to analyse the two sexes separately. While the separate analyses of co-ethnic marriage and intermarriage provide a good overview of trends and patterns across ethnic groups for one marriage type at a time, these models do not yet achieve a true comparison between ethnic groups or marriage types. .

Table 3: Relative risk of endogamous and exogamous marriage among immigrants and their descendants

Category	Women endogamous			exogamous		
	coef	Sign.	95% Conf. Int.	RR	Sign.	95% Conf. Int.
Age group						
15–19	0.40	***	0.38 – 0.42			
20–24	1.00		0.95 – 1.04			
25–29	1					
30–34	0.68	***	0.63 – 0.73			
35+	0.39	***	0.36 – 0.43			
Birth cohort						
1950–1959	1.10	***	1.05 – 1.15			
1960–1969	1					
1970–1979	1.00		0.96 – 1.05			
1980–1989	0.83	***	0.78 – 0.88			

Table 3: (Continued)

Category	Women					
	endogamous			exogamous		
	coef	Sign.	95% Conf. Int.	RR	Sign.	95% Conf. Int.
Country and migrant group						
United Kingdom						
1G Europe and West	0.41	***	0.30 – 0.56	0.95		0.73 – 1.24
2G Europe and West	0.08	***	0.05 – 0.13	0.94		0.73 – 1.23
1G India	2.70	***	2.09 – 3.49	0.56	***	0.39 – 0.80
2G India	1.00			0.65	*	0.46 – 0.93
1G Pakistan and Bangladesh	4.40	***	3.46 – 5.60	0.31	***	0.20 – 0.47
2G Pakistan and Bangladesh	2.07	***	1.55 – 2.75	0.25	***	0.14 – 0.43
1G Caribbean	0.31	***	0.20 – 0.47	0.18	***	0.11 – 0.31
2G Caribbean	0.19	***	0.12 – 0.28	0.15	***	0.10 – 0.24
France						
1G Maghreb	2.16	***	1.71 – 2.73	0.41	***	0.31 – 0.54
2G Maghreb	0.94		0.74 – 1.20	0.57	***	0.44 – 0.74
1G Sub-Saharan Africa	1.21		0.93 – 1.58	0.66	**	0.49 – 0.89
2G Sub-Saharan Africa	0.16	***	0.08 – 0.32	0.72		0.49 – 1.05
1G Turkey	4.52	***	3.52 – 5.79	0.19	***	0.10 – 0.34
2G Turkey	2.66	***	1.97 – 3.60	0.31	***	0.17 – 0.59
1G Southern Europe	1.30	*	1.01 – 1.67	1.12		0.87 – 1.45
2G Southern Europe	0.23	***	0.17 – 0.31	1.07		0.84 – 1.36
Belgium						
1G Italy	1.69	***	1.34 – 2.14	1.21		0.95 – 1.54
2G Italy	0.46	***	0.35 – 0.59	0.76	*	0.59 – 0.97
1G Morocco	3.24	***	2.57 – 4.08	0.37	***	0.28 – 0.49
2G Morocco	1.75	***	1.35 – 2.26	0.23	***	0.15 – 0.35
1G Turkey	5.54	***	4.40 – 6.99	0.22	***	0.15 – 0.33
2G Turkey	3.88	***	2.98 – 5.06	0.37	***	0.22 – 0.61
Switzerland						
1G Southern Europe	1.91	***	1.47 – 2.48	0.53	***	0.38 – 0.75
2G Southern Europe	0.81		0.61 – 1.08	0.99		0.75 – 1.30
1G For. Yugoslavia and Turkey	1.98	***	1.45 – 2.70	1.04		0.71 – 1.51
2G For. Yugoslavia and Turkey	1.75	**	1.23 – 2.51	0.75		0.46 – 1.22
1G Western Europe	0.70	*	0.52 – 0.94	0.81		0.61 – 1.08
2G Western Europe	0.09	***	0.04 – 0.20	1.35	*	1.00 – 1.83
Estonia						
1G Russian speaker	4.34	***	3.42 – 5.50	0.65	**	0.48 – 0.88
2G Russian speaker	3.79	***	2.99 – 4.79	0.60	***	0.44 – 0.81
Romania						
Ethnic Hungarian	1.96	***	1.55 – 2.48	0.29	***	0.22 – 0.39
Spain						
1G Morocco	1.83	***	1.43 – 2.34	0.52	***	0.38 – 0.70
1G Romania	2.10	***	1.64 – 2.69	0.22	***	0.14 – 0.32
1G Ecuador	0.99		0.76 – 1.30	0.19	***	0.13 – 0.28
1G Colombia	0.47	***	0.35 – 0.62	0.44	***	0.33 – 0.59
1G EU25	0.28	***	0.21 – 0.36	1.11		0.88 – 1.40
Education level						
Unknown	0.89		0.78 – 1.01			
Low	1					
Medium	0.82	***	0.79 – 0.86			
High	0.55	***	0.52 – 0.57			
Constant	0.005	***	0.004 – 0.006			

Source: Authors' own calculation based on data from surveys and censuses from seven countries; for more details see data section.
 Note: Significance level: *** = p-value < 0.001, ** = p-value < 0.01, * = p-value < 0.05. 1G (1st generation) refers to immigrants, while 2G (2nd generation) refers to their descendants.

Regarding the effects from the socioeconomic covariates, women have the highest risk of marrying a co-ethnic partner in their early 20s, while intermarriage levels are highest in their late 20s. For men, both marriage types experience their highest level when they are in their late 20s. For both men and women there is a cohort effect, with higher marriage risks for older cohorts and lower risks for the youngest birth cohort. This reflects the ongoing trend of marriage losing its status as the only form of partnership. The postponement of marriage to later ages might also result in not all individuals from the youngest cohorts having entered marriage at the time of data collection, although they may plan to do so eventually.

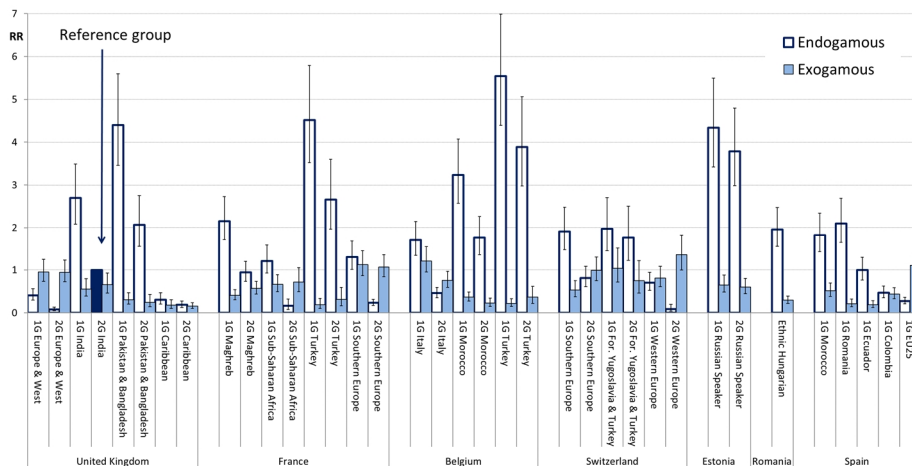
The education variable shows a strong gradient for co-ethnic marriage, with much lower risks among women with higher educational degrees. For intermarriage the effect is different: women with a medium education level show higher risks, while those with high education cannot be distinguished statistically from women with low education. The effect of education exhibits a different pattern for men. For them, education is positively correlated with the propensity to form an endogamous marriage, leaving lower-educated men with the lowest risk of co-ethnic marriage. Men with a medium level of education not only have the highest risk of endogamous marriage, but also the lowest risk of exogamous marriage. Lower-educated men, on the other hand, show the lowest propensity for co-ethnic marriage and the highest risk of intermarriage, leaving the highly educated men in a medium position for both types of marriage. These results hint that different mechanisms are at work for low- and high-educated men, related to chances in the marriage market (status exchange theory) or socialisation through education and employment. The different impact of education for men and women also suggests that education has a different value and bargaining power for the two sexes.

5.3 Simultaneous analysis of co-ethnic marriage and intermarriage

A direct comparison between the two types of marriage requires simultaneous modelling with a common reference category for all migrant groups and both marriage types. The effects of the covariates remain (largely) the same as in the previous analysis. Therefore, Figure 1 and Figure 2 display only the relative risks of the migrant groups for the simultaneous models for men and women. Figure 1 shows relative risks for immigrant women and their descendants, using the endogamous marriages of descendants of Indian immigrants in the United Kingdom as the overall reference category (exact coefficients of all variables are displayed in Table A-1 in the Appendix), and Figure 2 shows the equivalent for men. Both figures confirm our initial observation that across all migrant groups and both sexes the majority of individuals opt for a co-ethnic first marriage. A stronger propensity for mixed-ethnic marriage can only

be observed in a few cases and only among migrant groups with a European background.

Figure 1: Simultaneous model of endogamous and exogamous marriages among immigrants and their descendants, women

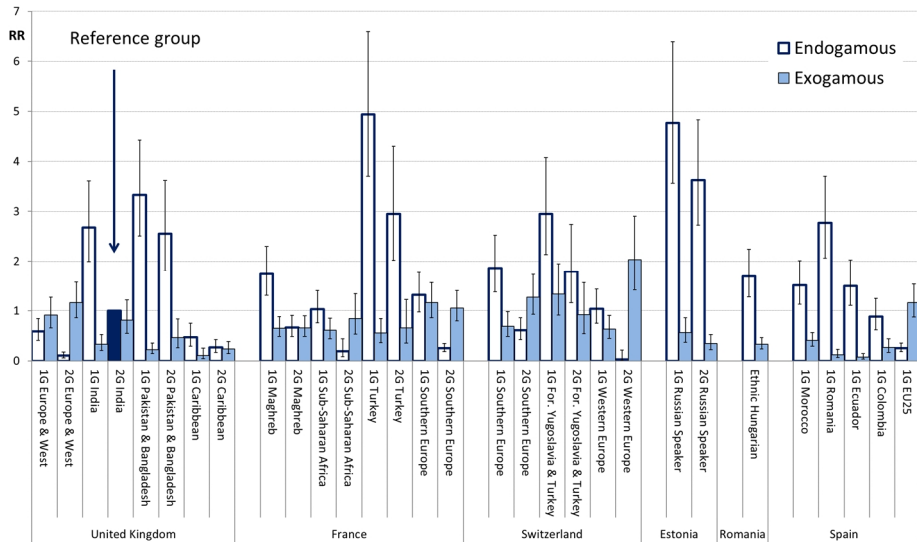


Source: Authors' own calculation based on data from surveys and censuses from seven countries; for more details see data section. Note: Model controls for birth cohort, age group, and education. Reference is second-generation Indian immigrants in the United Kingdom with endogamous marriage. 1G (1st generation) refers to immigrants, 2G (2nd generation) refers to their descendants. For detailed results see Table A-1 in the Appendix.

Across the seven countries, many ethnic groups show a prevalence of co-ethnic first marriages that is many times higher than for intermarriages. Once again, the largest difference between the two types of marriage is observed for the non-EU migrant groups.

Some groups that show overall low marriage rates also show low rates for both marriage types in the simultaneous analysis. Additionally, these groups (Caribbeans in the United Kingdom, sub-Saharan Africans in France, and Colombians in Spain) show very small differences in the prevalence of both marriage types, which in some cases cannot be statistically distinguished from each other. This is true for both generations of the affected migrant groups and is mainly due to late marriage entry and a preference for alternative union types such as cohabitation (Hannemann and Kulu 2015; Miner 2003).

Figure 2: Simultaneous model of endogamous and exogamous marriages among immigrants and their descendants, men



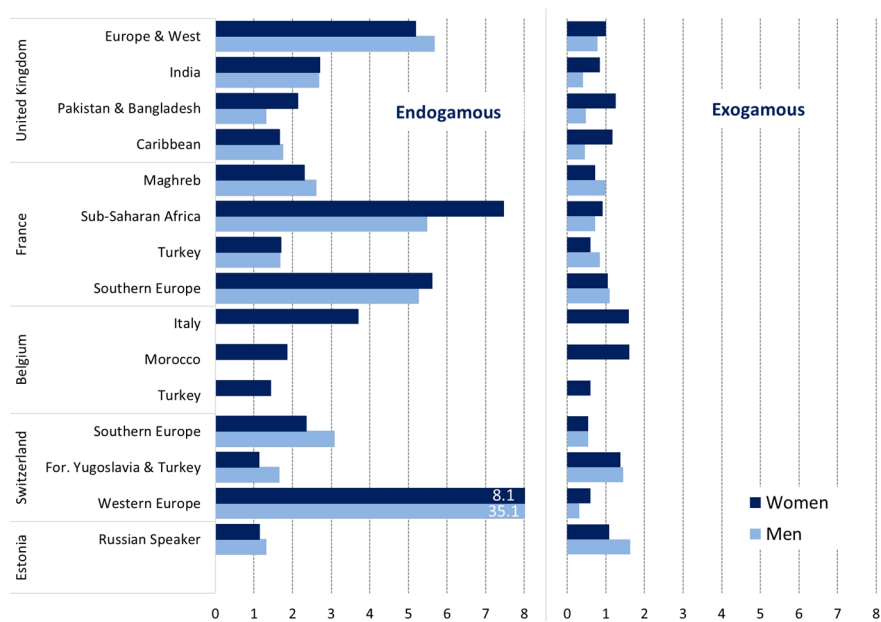
Source: Authors' own calculation based on data from surveys and censuses from seven countries; for more details see data section..
 Note: Model controls for birth cohort, age group, and education. Reference is second-generation Indian immigrants in the United Kingdom with endogamous marriage. 1G (1st generation) refers to immigrants, 2G (2nd generation) refers to their descendants. For detailed results see Table A-1 in the Appendix.

To highlight generational patterns, Figure 3 displays the ratio of the relative risks of first and second generations for each migrant group from the simultaneous analysis of women (dark colour) and men (light colour). Values above 1 indicate higher relative risk for the first generation, whereas values below 1 signify higher relative risk for the second generation. All migrant groups display higher relative risks of endogamous marriage in the first generation than among their descendants, which is true for both sexes. The highest relative risk ratios, and therefore the largest relative differences between the generations, is observed for European and Western migrants in the United Kingdom, sub-Saharan African and Southern European migrants in France, and Western European migrants in Switzerland. In all four migrant groups the low endogamous risk of first marriage in the first generation is trumped by an extremely low risk of endogamous marriage among their descendants. This could be the result of the economic and demographic composition of those migrant groups or their lack of prioritising a co-ethnic partner. Relative risk ratios closer to 1 are observed for several migrant groups with more traditional family values, meaning a more similar endogamous marriage risk across the two generations (e.g., Pakistani and Bangladeshi

in the United Kingdom, Turkish in France, Moroccan and Turkish in Belgium, former Yugoslav and Turkish in Switzerland, and Russian-speakers in Estonia).

The picture is more heterogeneous for exogamous first marriage. Most generational relative risk ratios are below 1, indicating higher exogamous marriage risk among the second generation than among their parents' generation. The smallest relative ratios are produced on the one hand by a rather small increase of exogamous marriage risk among the second generation compared to already very low risks among their parents' generation (e.g., Indian, Pakistani, and Bangladeshi in the United Kingdom), and on the other hand by sizeable increased risks among the second generation (e.g., Southern and Western Europeans in Switzerland). These two patterns can have different origins.

Figure 3: Ratios of relative risks of 1st generation by 2nd generation of the same migrant group in the simultaneous model, endogamous and exogamous marriages for women and men



Source: Authors' own calculation based on data from surveys and censuses from seven countries; for more details see data section.
 Note: Model controls for birth cohort, age group and education. 1G (1st generation) refers to immigrants, 2G (2nd generation) refers to their descendants. For detailed results see Table A-1 in the Appendix.

While differences between trends among women and men are in general smaller than those between ethnic groups and migrant generations, several examples show that for certain migrant groups the choice of a co-ethnic or a mixed-ethnic marriage varies between the sexes. As already mentioned, the generational difference in the Pakistani and Bangladeshi group is strong and significant for women but does not show significant changes for men. Columbian women in Spain show an equal prevalence of co-ethnic marriage and intermarriage, whereas men from the same ethnic background show a much higher prevalence for co-ethnic marriage. However, for both sexes of this ethnic group the overall marriage risk is low.

6. Conclusions

This study analysed the formation of co-ethnic and mixed-ethnic first marriages among immigrants and their descendants in seven European countries. After presenting unadjusted marriage rates, event history methods were used to produce relative risks for the two competing events, separately for men and women. Additionally, simultaneous models were estimated to compare marriage risks not only across the migrant groups but also across the two marriage types. For five out of the seven countries, both first- and second-generation migrant groups were observed to change marital behaviour across generations.

This article addressed the following research questions: (1) How do the risks of co-ethnic marriage and intermarriage vary across migrant groups within and between the countries? (2) To what extent does the risk of intermarriage change between immigrants and their descendants? (3) Does the risk of co-ethnic marriage and intermarriage vary between men and women across the migrant groups?

Regarding the first research question, the analysis showed large variation in first marriage risks across migrant groups, both within and between countries. In many cases, migrants from non-EU countries with distant cultural backgrounds showed high endogamous marriage risks; for example, Pakistanis and Bangladeshis in the United Kingdom, Turks and Maghrebians in France, Turks in Belgium, Russian-speakers in Estonia, and ethnic Hungarians in Romania. For these groups the results showed high overall marriage risks, which can be linked to more conservative marriage patterns, including early and almost universal marriage behaviour (Hannemann and Kulu 2015; Kulu and González-Ferrer 2014; Pailhé 2015). At the same time, these groups showed low intermarriage rates.

At the other end of the spectrum there are migrant groups that show very low overall marriage risks, with very few differences in the prevalence for one or the other marriage type, such as Caribbeans in the United Kingdom and sub-Saharan Africans in

France. These immigrant groups place less importance on the institution of marriage and have family formation traditions different from those common in most European countries (Miner 2003). Overall, the results support the theory of socialisation, showing the importance of cultural heritage in family formation decisions regarding the ethnic background of the first marriage partner. This can also explain why European migrants showed relatively high intermarriage rates across countries, assuming that the marriage pattern and partner choice criteria are similar in their country of origin and destination.

With respect to the second research question, changes in the risk of co-ethnic marriage and intermarriage could be observed between the two migrant generations, but the magnitude of the difference depended strongly on the migrant group. The largest decrease in co-ethnic marriage rates was observed for groups where immigrants showed high endogamous marriages rates. This could result from a combination of sub-cultural and native mainstream influences on the life decisions of the descendants of immigrants. Often it is a blend of being raised with the more conservative values of their ethnic background and the influence of the more liberal partner-search behaviour of native peers. Opportunities for prolonged education might further postpone first marriage for the second-generation. In many, though not all, of these migrant groups, a simultaneous rise in intermarriage risk can be observed between first and second generations.

Higher risks of exogamous marriage can also be related to the level of adaptation their parents underwent after arrival in the host country. If parents engage in the host culture more intensely there is an increased likelihood that their children will develop marriage norms and expectations that are more similar to those of the native population. In that case, higher rates of inter-ethnic marriage could be interpreted as an increasing level of mutual acceptance in the host and immigrant populations (Goldscheider 2007). Research has also shown that the descendants of mixed-ethnicity parents (one parent is foreign-born while the other is native) have a higher propensity to choose a native partner themselves (Logan and Shin 2012; Monden and Smits 2005).

In addition to adaptation effects, structural opportunity theory could also explain the higher intermarriage rates among descendants of immigrants (Blau 1977). In order to test if the observed generational differences are predominantly due to increased exposure to natives in the host country and less a result of the fact that many first-generation immigrants already arrived with a marriage partner, an additional analysis of unadjusted marriage rates and rate ratios was performed, excluding all individuals who arrived married in the host country. As shown in Table A-2 (Appendix), the exogamous marriage rates are lower than before for most migrant groups, but overall patterns remain. Smaller variation in the exogamous marriage rate also suggests that not all immigrants arrive in the destination country with a co-ethnic partner. Furthermore, in Belgium all three analysed migrant groups show even higher co-ethnic marriage rates

when the sample is reduced to post-migration marriages. This can partly be explained by the phenomenon of importing a partner from the country of origin (González-Ferrer 2006b; Lievens 1999). The import of marriage partners from the country of origin and marriages across immigrant generations are common among certain migrant groups (Huschek, de Valk, and Liefbroer 2012; Milewski 2010), including Turkish men and women in many Western European countries, and this involves individuals from both the first and second generation.

The role of imported spouses is too complex to be analysed in depth in this seven-country comparative study; however, these mechanisms and a general ‘globalisation’ of the marriage market (Niedomysl, Osth, and van Ham 2010) have to be taken into account when interpreting co-ethnic and intermarriage rates across ethnic groups.

Regarding the third and final research question – the investigation of intermarriage variation between the sexes – a younger marriage age for women is clear in the coefficients for age groups. Comparing migrant group-specific marriage risks, in most cases the results for men and women do not vary substantially. Among co-ethnic marriages the largest differences are observed for Pakistanis and Bangladeshis in the United Kingdom and immigrants from (former) Yugoslavia and Turkey in Switzerland. Interestingly, for the first group, women show a higher risk of exogamy among the immigrants, whereas men display a higher risk among the descendants of immigrants. For mixed-ethnic marriage the largest differences between men and women are found for the descendants of Indian immigrants in the United Kingdom (women have higher risks), for Western Europeans in the United Kingdom and Switzerland (men have higher risks), and for descendants of Russian-speaking migrants in Estonia (men show lower rates than women). Strong gender differences in the effect of education were also observed in the various models. However, the mechanisms behind those appeared to be rather complex. The lack of clear support for the status exchange theory could partly be due to cross-country restrictions on the transferability of skills and qualifications. An immigrant’s higher educational degree is not always tradable or even a desirable trade option in the destination country (Maffioli, Paterno, and Gabrielli 2014). While this study used education as one of the basic explanatory factors for marriage type, in-depth research is needed to understand the complex impact of education on marriage choices across the sexes, in combination with the cultural aspect of different ethnic backgrounds and structural constraints in the destination country. Given the variety in the magnitude and direction of the differences between men and women, it is hard to find overall patterns. The results suggest that gender differences are dependent on the ethnic background of migrants as well as the country of destination. Further, structural aspects like sex distribution in the migration groups could play an important role, especially for smaller migrant groups. For example, research in Belgium (Lievens 1999) shows that co-ethnic marriage (and especially marriage to an imported partner) is most common

for Turkish and Moroccan women who are expected to be more integrated (e.g., highest educational level). These findings could indicate that endogamous marriage can also be an option for more integrated second-generation women, combining traditional marriage choices with aspirations towards independence and a more modern life style, since highly educated women will have a strong negotiation position in their relationship.

Finally, the country comparison also revealed certain country-specific patterns. In Estonia, for example, we observe relatively high first-marriage risks for both generations of Russian-speaking migrants. Structural and historic circumstances have shaped family formation patterns since the middle of the 20th century, which are also found among Estonian natives (Puur et al. 2012; Rahnu et al. 2015). Switzerland displays high overall marriage rates together with relatively high risks of intermarriage among several of its migrant groups, particularly those originating from neighbouring Western European countries. This supports previous studies showing a comparatively wide acceptance of mixed marriages in these groups in the Swiss context (Carol 2013; Potârcă and Bernardi 2018). These country-specific marriage patterns, shaped by historic and social developments, have to be carefully taken into account when interpreting the variation in marriage patterns across national borders (Hannemann et al. 2014).

Each country's own migration history shaped the size and composition of its migrant population, leading to the specific combinations of country of origin and destination, such as Caribbeans in the United Kingdom or Latin Americans in Spain. However, there are certain groups of immigrants which settled in several European countries due to large migration waves (e.g., post-war labour migration). This cross-country comparison allows the analysis of intermarriage among certain migrant groups regarding the impact of the host society. The Turkish immigrants in France, Belgium, and Switzerland (in the latter case in a combined group with individuals from former Yugoslavia) show very similar patterns. In all three countries, this migrant group displays the highest risks of endogamy and the lowest risk of exogamy. This consistent pattern across host countries leads to the assumption that partner choice is strongly influenced by socialisation and minority subculture. Country context and adaptation play a less important role for this migrant group.

A similar conclusion (albeit in the opposite direction) holds for Western European immigrants, who in all countries show low risks of endogamy and high risks of exogamy. In these cases, smaller cultural and socioeconomic distances to the host society enhance adaptation and integration processes as well as acceptance in the host society. This could be influenced by legal requirements for residence and work permits, which often vary between European and non-European immigrants, often including stricter demands for the latter group. However, these results should be interpreted

carefully, since the aggregated groups of Western Europeans are different in composition and size for each country in this analysis, masking aspects of heterogeneity.

Despite all efforts to make the data from the different countries comparable, the harmonization process across seven different countries and data sources is incomplete. First, data for the United Kingdom and Belgium includes only first marriages that persisted until the interview or census date, which may introduce a bias for those two countries by giving greater weight to the marriage patterns of more recent birth cohorts and younger age groups, since they are more likely to still be in their first marriage. This may entail an overestimation of endogamous marriage rates. For the same reason, we might also overestimate the rate of intra-group marriages in migrant groups with strong endogamous preference because higher divorce risks were found for inter-ethnic marriages (Jones 1996; Kalmijn, de Graaf, and Janssen 2005; Milewski and Kulu 2014), resulting in a lower chance of being included in this study. The limitations introduced by the incomplete data harmonization are described in more detail in the data section.

Second, the study had to limit the number of covariates to the three most important (age, birth cohort, and education). Unfortunately, this means that our study could not take into account the effects of other important characteristics such as language skills, occupation, income, religion, and religiosity, which all presumably play a significant role in partners' choices.

Overall, this study offers a valuable insight into the prevalence of co-ethnic and mixed-ethnic first marriages across migrant groups from seven different European countries, including the most important immigrant groups and their descendants in each respective country.

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Appendix

Table A-1: Simultaneous modelling of endogamous and exogamous first marriage risks among immigrants and their descendants, stratified by sex

Category	Women				Men			
	endogamous		exogamous		endogamous		exogamous	
	RR	95% Conf. Int.	RR	95% Conf. Int.	RR	95% Conf. Int.	RR	95% Conf. Int.
Age group								
15–19	0.40 ***	0.38 – 0.42			0.08 ***	0.07 – 0.09		
20–24	1.00	0.95 – 1.04			0.62 ***	0.59 – 0.65		
25–29	1				1			
30–34	0.68 ***	0.63 – 0.73			0.88 ***	0.82 – 0.94		
35+	0.39 ***	0.36 – 0.43			0.55 ***	0.50 – 0.61		
Birth cohort								
1950–1959	1.10 ***	1.05 – 1.15			1.19 ***	1.12 – 1.26		
1960–1969	1				1			
1970–1979	1.00	0.96 – 1.05			0.88 ***	0.83 – 0.93		
1980–1989	0.83 ***	0.78 – 0.88			0.59 ***	0.54 – 0.65		
Country and migrant group								
United Kingdom								
1G Europe and West	0.41 ***	0.30 – 0.56	0.95	0.73 – 1.24	0.58 **	0.41 – 0.84	0.91	0.65 – 1.27
2G Europe and West	0.08 ***	0.05 – 0.13	0.94	0.73 – 1.23	0.10 ***	0.06 – 0.18	1.16	0.86 – 1.57
1G India	2.70 ***	2.09 – 3.49	0.56 ***	0.39 – 0.80	2.68 ***	1.99 – 3.61	0.33 ***	0.21 – 0.52
2G India	1		0.65 *	0.46 – 0.93	1		0.81	0.55 – 1.21
1G Pakistan and Bangladesh	4.40 ***	3.46 – 5.60	0.31 ***	0.20 – 0.47	3.33 ***	2.51 – 4.42	0.22 ***	0.14 – 0.35
2G Pakistan and Bangladesh	2.07 ***	1.55 – 2.75	0.25 ***	0.14 – 0.43	2.55 ***	1.80 – 3.62	0.46 *	0.26 – 0.84
1G Caribbean	0.31 ***	0.20 – 0.47	0.18 ***	0.11 – 0.31	0.47 **	0.29 – 0.75	0.11 ***	0.05 – 0.25
2G Caribbean	0.19 ***	0.12 – 0.28	0.15 ***	0.10 – 0.24	0.27 ***	0.17 – 0.43	0.24 ***	0.15 – 0.39
France								
1G Maghreb	2.16 ***	1.71 – 2.73	0.41 ***	0.31 – 0.54	1.74 ***	1.31 – 2.30	0.65 **	0.48 – 0.88
2G Maghreb	0.94	0.74 – 1.20	0.57 ***	0.44 – 0.74	0.66 **	0.49 – 0.91	0.66 **	0.48 – 0.90
1G Sub-Saharan Africa	1.21	0.93 – 1.58	0.66 **	0.49 – 0.89	1.03	0.76 – 1.40	0.61 **	0.44 – 0.85
2G Sub-Saharan Africa	0.16 ***	0.08 – 0.32	0.72	0.49 – 1.05	0.19 ***	0.08 – 0.44	0.85	0.53 – 1.34
1G Turkey	4.52 ***	3.52 – 5.79	0.19 ***	0.10 – 0.34	4.94 ***	3.70 – 6.59	0.56 **	0.37 – 0.84
2G Turkey	2.66 ***	1.97 – 3.60	0.31 ***	0.17 – 0.59	2.95 ***	2.02 – 4.30	0.65	0.35 – 1.22
1G Southern Europe	1.30 *	1.01 – 1.67	1.12	0.87 – 1.45	1.32	0.98 – 1.77	1.16	0.86 – 1.57
2G Southern Europe	0.23 ***	0.17 – 0.31	1.07	0.84 – 1.36	0.25 ***	0.18 – 0.35	1.06	0.79 – 1.40

Table A-1: (Continued)

Category	Women			Men		
	endogamous RR	95% Conf. Int.	RR	endogamous RR	95% Conf. Int.	RR
Belgium						
1G Italy	1.69 ***	- 2.14	1.21	0.95	- 1.54	
2G Italy	0.46 ***	- 0.59	0.76 *	0.59	- 0.97	
1G Morocco	3.24 ***	- 4.08	0.37 ***	0.28	- 0.49	
2G Morocco	1.75 ***	- 2.26	0.23 ***	0.15	- 0.35	
1G Turkey	5.54 ***	- 6.99	0.22 ***	0.15	- 0.33	
2G Turkey	3.88 ***	- 5.06	0.37 ***	0.22	- 0.61	
Switzerland						
1G Southern Europe	1.91 ***	- 2.48	0.53 ***	0.38	- 0.75	1.86 ***
2G Southern Europe	0.81	- 1.08	0.99	0.75	- 1.30	0.61 **
1G For. Yugoslavia and Turkey	1.98 ***	- 2.70	1.04	0.71	- 1.51	2.94 ***
2G For. Yugoslavia and Turkey	1.75 **	- 2.51	0.75	0.46	- 1.22	1.78 **
1G Western Europe	0.70 *	- 0.94	0.81	0.61	- 1.08	1.03
2G Western Europe	0.09 ***	- 0.20	1.35 *	1.00	- 1.83	0.03 ***
Estonia						
1G Russian speaker	4.34 ***	- 5.50	0.65 **	0.48	- 0.88	4.77 ***
2G Russian speaker	3.79 ***	- 4.79	0.60 ***	0.44	- 0.81	3.63 ***
Romania						
Ethnic Hungarian	1.96 ***	- 2.48	0.29 ***	0.22	- 0.39	1.69 ***
Spain						
1G Morocco	1.83 ***	- 2.34	0.52 ***	0.38	- 0.70	1.51 **
1G Romania	2.10 ***	- 2.69	0.22 ***	0.14	- 0.32	2.77 ***
1G Ecuador	0.99	- 1.30	0.19 ***	0.13	- 0.28	1.50 **
1G Colombia	0.47 ***	- 0.62	0.44 ***	0.33	- 0.59	0.88
1G EU25	0.28 ***	- 0.36	1.11	0.88	- 1.40	0.25 ***
1G Other European	0.00 ***	- 0.00	0.57 **	0.41	- 0.81	0.00 ***
1G Other Latin America	0.89	- 1.01	0.68 **	0.53	- 0.87	1.00 ***
Education level						
Unknown	0.82 ***	- 0.79	- 0.86			
Low	1					1
Medium	0.00 ***	- 0.00	- 0.00	0.00 ***	- 0.00	0.00
High	0.00 ***	- 0.01	- 0.01	0.00 ***	- 0.01	0.00
Constant	0.005 ***	- 0.004	- 0.006	0.003 ***	- 0.002	0.004

Source: Authors' own calculation based on data from surveys and censuses from seven countries; for more details see data section..
 Note: Significance level: *** = p-value < 0.001, ** = p-value < 0.01, * = p-value < 0.05. 1G (1st generation) refers to immigrants, while 2G (2nd generation) refers to their descendants.

Table A-2: Sensitivity analysis. Unadjusted marriage rates for all and only post-migration marriages among immigrants and their descendants, stratified by sex

Unadjusted rates	Women						Men					
	All marriages			Post-migration marriages			All marriages			Post-migration marriages		
	Endo-gamous	Exo-gamous	Relative rates	Endo-gamous	Exo-gamous	Relative rates	Endo-gamous	Exo-gamous	Relative rates	Endo-gamous	Exo-gamous	Relative rates
United Kingdom												
1G Europe and West	1.0	2.2	0.4	0.4	2.0	0.2	1.0	1.6	0.6	0.3	1.5	0.2
2G Europe and West	0.2	2.4	0.1	0.2	2.4	0.1	0.2	2.4	0.1	0.2	2.4	0.1
1G India	6.1	1.3	4.9	3.7	1.3	2.9	4.0	0.5	8.1	2.7	0.6	4.9
2G India	2.3	1.5	1.5	2.3	1.5	1.5	1.6	1.3	1.2	1.6	1.3	1.2
1G Pakistan and Bangladesh	10.2	0.7	14.3	7.2	0.5	15.1	5.2	0.3	15.0	4.1	0.3	14.5
2G Pakistan and Bangladesh	4.4	0.5	8.4	4.4	0.5	8.4	3.1	0.6	5.5	3.1	0.6	5.5
1G Caribbean	0.9	0.5	1.7	0.7	0.4	1.6	1.2	0.3	4.3	0.9	0.2	3.6
2G Caribbean	0.5	0.4	1.2	0.5	0.4	1.2	0.6	0.5	1.1	0.6	0.5	1.1
France												
1G Maghreb	5.9	1.1	5.3	3.9	1.2	3.2	3.5	1.3	2.7	2.9	1.4	2.1
2G Maghreb	2.3	1.4	1.7	2.3	1.4	1.7	1.1	1.1	1.0	1.1	1.1	1.0
1G Sub-Saharan Africa	3.3	1.8	1.8	2.2	1.9	1.2	2.3	1.4	1.7	2.0	1.4	1.4
2G Sub-Saharan Africa	0.3	1.4	0.2	0.3	1.4	0.2	0.2	0.9	0.2	0.2	0.9	0.2
1G Turkey	11.2	0.5	23.9	8.7	0.5	18.1	7.0	0.8	8.9	5.9	0.9	6.6
2G Turkey	5.4	0.6	8.5	5.4	0.6	8.5	2.9	0.6	4.5	2.9	0.6	4.5
1G Southern Europe	3.6	3.1	1.2	2.8	3.3	0.9	2.7	2.4	1.1	2.4	2.5	1.0
2G Southern Europe	0.6	2.7	0.2	0.6	2.7	0.2	0.5	2.0	0.2	0.5	2.0	0.2
Belgium												
1G Italy	4.3	3.1	1.4	5.4	4.5	1.2						
2G Italy	1.0	1.7	0.6	1.0	1.7	0.6						
1G Morocco	8.6	1.0	8.8	8.7	1.3	6.7						
2G Morocco	3.6	0.5	7.7	3.6	0.5	7.7						
1G Turkey	13.5	0.5	25.1	14.5	0.7	22.3						
2G Turkey	7.2	0.7	10.6	7.2	0.7	10.6						
Switzerland												
1G Southern Europe	5.0	1.4	3.6	3.6	1.6	2.3	3.7	1.2	3.0	2.8	1.4	2.1
2G Southern Europe	2.0	2.5	0.8	2.0	2.5	0.8	1.2	2.2	0.5	1.1	2.3	0.5
1G For. Yugoslavia and Turkey	4.6	2.4	1.9	3.1	2.4	1.3	5.4	1.5	3.5	4.0	2.1	1.9
2G For. Yugoslavia and Turkey	3.9	1.7	2.3	3.9	1.7	2.3	2.6	0.7	3.8	2.2	1.1	1.9
1G Western Europe	1.6	1.8	0.9	0.6	1.9	0.3	2.0	1.1	1.8	0.8	1.2	0.6
2G Western Europe	0.2	3.1	0.1	0.2	3.1	0.1	0.2	3.5	0.1	0.1	3.7	0.0
Estonia												
1G Russian speaker	8.9	1.3	6.7	9.9	1.8	5.4	7.0	0.8	8.5	8.2	1.2	6.8
2G Russian speaker	7.6	1.2	6.3	7.6	1.2	6.3	5.1	0.5	10.5	5.1	0.5	10.5
Romania												
Ethnic Hungarian	5.0	0.8	6.7				3.0	0.6	5.1			
Spain												
1G Morocco	5.1	1.4	3.5	2.2	1.9	1.2	3.0	0.8	3.7	2.3	0.9	2.5
1G Romania	5.1	0.5	9.7	1.7	0.8	2.2	4.1	0.2	22.4	1.4	0.3	5.3
1G Ecuador	2.5	0.5	5.2	0.7	0.5	1.4	2.6	0.1	21.0	0.8	0.1	7.7
1G Colombia	1.2	1.1	1.1	0.5	1.2	0.4	1.7	0.5	3.3	0.7	0.5	1.4
1G EU25	0.7	2.8	0.3	0.3	2.8	0.1	0.5	2.3	0.2	0.2	2.3	0.1

Source: Authors' own calculation based on data from surveys and censuses from seven countries; for more details see data section.
Note: 1G (1st generation) refers to immigrants, while 2G (2nd generation) refers to their descendants.

