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Mixed-ethnic partnerships and ethnic reproduction among Roma women in Hungary

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WORKING PAPERS

ON POPULATION, FAMILY AND WELFARE

№ 37

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Laura Szabó

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ABSTRACT

The aim of the analysis was to document the prevalence of mixed-ethnic partnerships and the ethnic reproduction rate among the Roma population living in Hungary in 1990 and 2011, based on data from national censuses. The ethnic reproduction rate should be used as an input variable for population forecast of Roma population. Thus in the first part of the paper we reviewed the prevalence of endogamous and the mixed-ethnic partnerships, and the factors affecting the probability of mixed-ethnic partnership formation. In the second part of the paper we calculated on one hand the proportion of children born in mixed-ethnic partnerships identified by their parents as Roma, and on the other hand the ethnic reproduction rate measured among Roma women.

Our results indicated, that the proportion of Roma men and women living in endogamous partnerships decreased between 1990 and 2011 and this decrease was present in all educational groups. Conversely, the proportion of mixed ethnic partnerships increased in the last 20 years, as well the percentage of Roma men and women living in such partnerships.

The vast majority of children born in Roma endogamous partnerships was identified as Roma by their parents in 2011 (98.5%). In the mixed-ethnic partnerships only 38.4% of children was identified as Roma and 57% as non-Roma in 2011. Parents in mixed-ethnic partnerships were more likely to identify their children as non-Roma if the mother has a mixed- or non-Roma ethnicity; if the parents were 40 years of age or older; had at least vocational (men) or high school (women) education; lived in city and the concentration of Roma people in their residence place was low.

The ethnic reproduction rate of those Roma women and their children who consider themselves primarily (as their first identity) Roma, was 94.6% in 1990 and 89.5% in 2011. Thus the ethnic reproduction loss is 10% in 2011, which is twice as high as the 1990 reproduction loss, which was only 5%. Based on our calculations, we concluded that a process of demographic ethnic assimilation is taking place in Hungary among Roma women.

Keywords: Roma endogamous partnerships, mixed-ethnic partnerships, ethnic reproduction rate, national census, ethnic minority population forecast

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INTRODUCTION[1]

The goal of the present analysis was to calculate an input factor for a population projection regarding the Roma population: to estimate the level of ethnic assimilation. In order to forecast the size of a national or ethnic minority living in a given geographical area, it is not enough to base calculations on the usual factors of population projection (number of births, life expectancy at birth, migration balance), the processes of ethnic assimilation should also be taken into account. Our goal was to develop well-founded ethnic reproduction indicators in order to estimate the proportion of members of the Roma minority who suffer an assimilation loss in favour of the majority population. In this analysis, the concept of ethnic assimilation is solely interpreted from a demographic perspective. We accept Szilágyi's (2002, 2004) definition as a starting point, and we consider ethnic assimilation to be any process in which the population and/or reproduction of one (ethnic minority) population decreases in favour of another (ethnic majority) population. At the same time, we are aware that data on mixed-ethnic partnerships and ethnic reproduction go far beyond being merely input variables for a population projection, as they can also provide an indication of the Roma and non-Roma intergroup relationships might be like, and what the level of exclusion or acceptance of the minority group is.

As the primary (measurable) context of ethnic assimilation is mixed-ethnic marriages and partnerships[2], as a first step, we review the mixed-ethnic partnerships of the Roma population. We then examine the reported ethnicity of their children born in such partnerships, inquired via population censuses. Ethnic reproduction is not estimated for children born into partnership-based families only, but in single parent families as well. However, since the majority of children are born and are living in partnership-based families, we considered it important to examine the issue of mixed-partnerships at first step.

The study is structured as follows. In the first part, we review the results of theoretical and empirical research to date on who and why form mixed-ethnic partnerships and the proportion of children reported as ethnic minority or majority by their parents living in mixed-ethnic partnerships. Then we present our results on what we can observe about the mixed-ethnic partnerships and the ethnic reproduction rates of Roma on the basis of the Hungarian census data (1990, 2011). As we have already indicated, these data provide good support for the Roma ethnic population projection.

1 I thank Balázs Kapitány for his valuable comments on the first version of the manuscript. I also thank for Lukacs Hayes for the English translation of the original Hungarian version.

2 In the case of Hungarian minority communities living in the Carpathian Basin, for example, mixed-ethnic partnerships are not the only risk factor for ethnic reproduction, but also intra- and intergenerational assimilation (Szilágyi 2002) and the fact that these minorities live in ethnic dispersion (Gyurgyik et al. 2010). Dispersion greatly reduces the chances of ethnic reproduction. If the Hungarian population falls below a critical number in a given area, then Hungarian-language institutions and cultural practices are pushed into the background, institutions can no longer be maintained, which would be essential for the reproduction of Hungarian identity. In the case of Roma living in Hungary (or anywhere), however, these practices were never very significant and thus decisive for ethnic reproduction.

THEORETICAL OVERVIEW

ABOUT MIXED-ETHNIC PARTNERSHIPS

Marriage and cohabitation are two of the most intimate forms of partnerships. If two parties of different ethnicities or nationalities establish such a close relationship, it can also mean that the two groups accept each other, get to know each other better, and tend to show fewer negative attitudes towards each other's group (Lőrincz 2014, Kalmijn and van Tubergen 2010, Pettigrew and Tropp 2006).[3] Children born in such partnerships may be more accepting of the ethnic culture of both of their parents (Hannemann et al. 2018).

The two determinants of partner choice theories are the set of possibilities (constraints) and preferences. In addition to the aesthetic, social and economic characteristics of the chosen party, the members of a minority group are chosen as married or cohabiting according to group norms (i.e., the environment allows or punishes the establishment of a partnership with a partner of another ethnicity) and the so-called marriage market, in which the parties are looking for a partner (the number and proportion of co-candidates of a given ethnicity living in the neighbourhood, school or workplace of the person; the quality of relationship with them; the degree of residential segregation etc.). While consideration of individual characteristics and group norms supports ethnic endogamy (i.e., marriage of parties from the same ethnic minority background), conditions dictated by the marriage market may counteract this.

But based on what *personal characteristics* do men and women choose a partner? According to the literature, the parties most often assess the other's *socio-economic resources* (what socio-economic benefits the other can provide to them; because the other has what they do not have etc.) or *cultural similarity* (language, religion, customs, values, parenting principals). Socio-economic resources are important from the point of view that the individual wants to maximize their own income and the status of their family, therefore he/she is looking for a partner with such resources. Individuals with higher socioeconomic status are also likely to choose a similarly high-status partner as a couple (Kalmijn 1998, Schwartz and Mare 2005, Bukodi 2001). This competition for well-resourced peers is somewhat overshadowed by the position of women in a given society or group, as exchange theory suggests that men with higher status or qualifications "exchange" their resources from paid work for the less educated wife's unpaid domestic work. Of course, not only might the transfer or exchange of paid and domestic work between the parties appear in a partnership, but also the exchange among parties belonging to different ethnic groups. A higher socio-economic status may be exchanged for a higher prestigious racial/ethnic status, for example. A party with a higher level of education/economic status but whom is from a lower social class, e.g., a minority group, may find a partner who, although lagging behind in educational attainment, belongs to the majority population, thus can be seen as "whitening" his/her offspring (Osuji 2013, Qian 1997, Gullickson 2006). And the need for cultural similarity between the parties stems from my partner being similar to me based on the values that matter to me - as we furnish our homes together, spend our free time together and raise our children together, which is much easier between parties with similar tastes and minds. This aspect was found to be of paramount importance by researchers when analysing the marriage behaviour of immigrants from Mexico, Turkey, Morocco, Muslims of the former Yugoslav

3 Naturally, the reverse is not necessarily true, since if one ethnic group enters into homogeneous partnerships, it does not necessarily mean that it rejects another ethnic group, as there may be numerous structural limitations to the lack of mixed-ethnic partnerships (Kalmijn 1998).

Republic (Coleman 1994, Qian and Lichter 2001, Dribe and Lundh 2008, Potarca and Bernardi 2018).

But whether people tend to form partnerships with someone of similar socio-economic or cultural backgrounds, also depend on the *permissive or punitive behaviour of the group or society that includes them*. A particular ethnic, national or religious minority group may consider it important to strengthen group identity, emphasizing a common past, pride, excellence, and through this, urge and expect its members not to mix - either by praising those who do not do so, or by punishing the ones that do (for example, by excommunication). There are findings that suggest that younger generations, those who leave their families and nations through mobility, those who move to cities, and those with higher education are less dependent on the compelling expectations of their families, religion, and ethnic groups (Uunk et al 1996). At the same time, there have been results that call into question whether this young generation would have a higher chance of forming mixed-ethnic partnerships. As opposed to or in addition to classical, linear assimilation theories (Gordon 1964), the concept of segmented assimilation has also emerged (Portes et al 2005), which states that there are racial, ethnic or migrant groups that are so socially, economically, and culturally segregated and discriminated against whom are in a position that they have no chance to integrate, from the margins of society into the majority population. As a kind of defense, an attitude called reactive identity has emerged among young people, as a result of which they consciously distance themselves from the youth of the majority population and do not form close relationships with them (Coleman 1994, Qian and Lichter 2011, Bessudnov and Monden 2020).

In addition to the individual and group-level factors presented so far, the demographic and structural constraints and opportunities referred to as the *marriage market* also limit the possibility of who can form a partnership of two individuals from different ethnic groups. This depends on the size of the two groups, whether there are a sufficient number of women or men of other ethnicity in the vicinity of someone seeking a partner. It also depends on how isolated an ethnic group is – even if an area is sparsely populated, but is ethnically segregated, individuals are more likely to find a partner from their own ethnic group (Tóth and Vékás 2008, Kemény et al. 2004).

Prevalence of ethnically endogamous and mixed-ethnic partnerships in some selected countries

Mixed-ethnic partnership research has a long history in the United States, where it was first examined mixed-ethnic marriages between black and white populations (Qian 1997, Qian and Lichter 2001, Bratter and Zuberi 2001, Gullickson 2006), and then mixed-ethnic marriages between immigrants and the local population (Coleman 1994, Hannemann et al., 2018). Analysing data from the 1990 census, Qian and Lichter (2001) found that racially endogamous marriages were 59 times more likely among African Americans, twice as likely among Asians and 31 times less likely among the Hispanic population than among whites. Among 20- to 29-year-old African Americans, the log-odds ratio of ethnic endogamy was 3.8 (Qian 1997)[4]. And the Pew Research Center (Livingston and Brown 2017), based on U.S. research data from 2014-2015, indicated that among newlyweds, 29 percent of the Asian, 27 percent of the Hispanic, and 18 percent of the African American population, while only 11 percent of the (non - Hispanic) white population was married in an ethnically, racially mixed manner.

4 Source: Qian (1997), Appendix Table A1., own calculation. Odds ratios show ethnic endogamy regardless of the size of the group. The higher its value, the greater the ethnic endogamy. For a detailed description, see the last paragraph of the Methodological Background/ Measuring mixed-ethnic partnerships subchapter.

As migration intensifies in these decades, more and more people in Western Europe are entering mixed-ethnic partnerships (Coleman 1994, Dribe and Lundh 2008, Potarca and Bernardi 2018).

In the former socialist countries of Central and Eastern Europe, analyses of mixed-ethnic partnerships between historical national and ethnic minorities and the ethnic majority have been conducted (Kiss 2016, Gyurgyik et al 2010, Monden and Smits 2005, Smits 2009, Bessudnov and Monden 2020). In Russia, for example, there are around 200 different ethnic groups, which is why the issue of ethnic intermarriages and partnerships is really interesting. Based on data from the 2010 census, Bessudnov and Monden (2020) presented the characteristics of mixed-ethnic partnerships of ethnic minorities living in four selected cities. In Moscow, where 92 percent of the population was of Russian ethnicity, 94 percent of Russian women and 98 percent of men were in endogamous partnerships at the time of the census. The log-odds ratio was 3.3 among Russians. This indicator is far higher among Armenians (5.7), Tatars (5.6) and Jews (5.6), while it was lower among Ukrainians (2.8) living in Moscow. And in the capital of Dagestan (Makhachkala), where the proportion of ethnic Russians was barely 5% in 2010, the log-odds ratio was already much higher than in Moscow: 6.4. The lowest value, here, was measured among the Avars, and even that figure was relatively high, 5.7 (24% of the urban population were Avars); but they also found ethnic groups where the log-odds was 8.6 (Nogais) and 8.3 (Aghuls) (their urban proportion was low, 1.2% and 0.9%, respectively).

We also present data from Yugoslavia, to which -, similarly to the above presented figures from Russia -, our results may be comparable. Smits (2009) described the rates of mixed-ethnic marriages between different ethnic groups involved in the Yugoslav war. He used as data source the 1981 census and marriage registers from 1963, 1974, 1982 and 1990. The majority of marriages in 1989 were with partners of the same ethnic background among Albanians (97%), Muslims (93%), Slovenes (93%), Macedonians (91%), Serbs (89%) and Croats (87%), but was also high among Hungarians (73%) and Montenegrins (73%). Montenegrins and Hungarians were more likely to marry a Serbian partner representing the ethnic majority population (17.5% of Montenegrins and 13.9% of Hungarians), while Muslims (2.7%), Slovenes (1.4%) or Albanians (0.4 %) were significantly less likely to do so. The log-odds ratio indicating the strength of marital endogamy was highest among Albanians (9.1) and Muslims (6.8), then among Macedonians (5.9) and Slovenes (5.6), followed by Hungarians (4.7), Montenegrins (4.2) and Croats (3.7). Ethnic endogamy was lowest among Serbs (3.1) in 1989.

Kiss (2016) examined ethnic Hungarians in Transylvania, Romania, living in mixed-ethnic partnerships, using the 10 percent samples of the 1977, 1992, and 2002 census data in Romania. The data indicated that the proportion of Hungarians living in ethnic intermarriages was 9.8% in 1977, 12.9% in 1992, and 13.6% in 2002 (Kiss 2016). Among the Hungarians from Transylvania, the log-odds indicating endogamy was 2.3 in 2002 (the proportion of Hungarians in the 16 counties of Transylvania was 19.8% at that time). However, this value was lower among the Hungarians living in southern Slovakia and married in 2001 (2.1; their proportion was 24%) and also among the Hungarians, living in Vojvodina, Serbia, and married in 2002 (1.7; their proportion was 14.3%).[5] These Hungarian national minorities living in Romania, Slovakia and Serbia are large, sometimes territorially concentrated, historical minorities, so they are not at all marginal minorities, as are the Roma in Central and Eastern Europe, who are less likely to form ethnically mixed partnerships, as we will see later, because they face a high degree of isolation and exclusion from the non-Roma (Kiss 2016).

Research in Hungary also confirms this exclusionary attitude towards the Roma, although there are very few data on the mixed-ethnic partnerships of the Roma.

5 Source: Kiss (2016), Table 6, own calculation.

Moreover, in micro-regional qualitative studies, it has been repeatedly stated that mixed-ethnic marriages between Roma/Gypsies and Hungarians are rare. From the study of Márta Gyenei we quote the following interview excerpt (1993: 28): "On the Hungarian side, crossing borders (friendship or marriage [with gypsies]) is subject to the most serious judgments, mostly resulting in exclusion. Exceptions occur only in the case of very strong compensation but are not typical."; and from the monograph of Cecília Kovai (2017: 55) the following interview excerpts: „However, ethnic differentiation not only designated positions but also regulated partnerships: there were almost no "mixed" marriages, but even "mixed" friendships were very rare and temporary. [...] In the late 1990s, early 2000s, in fact, nothing was deemed more powerful than having a lasting relationship with a non-Gypsy boy or girl." (Kovai 2017: 136). Analysing the data from the 2001 census, Tóth and Vékás (2008) estimated that 85 percent of Roma women were living in a homogeneous partnership. In Romania, according to the 2011 census, 92.9 percent of Roma couples are ethnically endogamous (Veres 2015).

ABOUT ETHNIC REPRODUCTION

The choice of respondents when declaring their national identity or their children' may change over time. Thus, an individual may change his or her ethnicity from one census to another. However, we do not have exact information on the degree of assimilation determined on the basis of auto-identification.[6] It can also happen that an individual declares his or her national identity, but when he or she was a minor at the previous census, his or her parents said otherwise (this is an auto-identification that does not match the previous hetero-identification).[7] In these two cases, there is actually an individual-level change of identity. And there is a third case – which is important for us in our study – when there is no change of ethnic identity on the individual level, but what happens is that the children of a Roma mother are no longer reported as Roma (for example, children born in mixed-ethnic partnerships). This is how biological and ethnic reproduction are separated (Szilágyi 2002). While the former denotes all live-born children of all Roma women, the latter refers only to the reproduction in which all children of all Roma women will also be reported as Roma. Naturally, ethnic reproduction gains can also arise during a census if non-Roma women declare their children to be Roma because their partner, the child's father, is Roma. In our analysis, we focus on this third aspect of ethnic assimilation.

Ethnically mixed partnerships pose a risk to the reproduction of ethno-cultural characteristics among a population (Gyurgyik et al. 2010; Szilágyi 2002; Kiss 2016; Finnäs and O'Leary 2003, Lichter and Quian 2018). Namely, mixed-ethnic partnerships, as opposed to ethnically endogamous (same-ethnicity) partnerships, create a medium of socialization where different cultural customs, norms and practices coexist. In such a case, in principle, the possibility of intermediate, hybrid identities are given, i.e., the children of mothers and fathers of different nationalities and ethnicities may have mixed cultural ties. However, with census questions, it is not easy to accurately measure the degrees and transitions of this identity, as the choice is largely situation dependent. The Roma in Hungary testify about their ethnic identity primarily during the censuses, as they do not have to declare this at school or at work. In connection with ethnic

6 This could only be measured statistically accurately if, in a longitudinal survey, the same individuals were to be asked about their nationality every five or ten years, and all respondents answered to the question at the time according to their beliefs, free from any external, political and other contextual influences. Moreover, interviewers would also accurately record these answers on the questionnaire (for experience with this, see Tánczos 2012). However, we have census data that are cross-sectional only and cannot be merged at the individual level, and we are forced to make an estimate based on these.

7 This is because the census practice is for parents to answer questions about the ethnic identity and mother tongue of their minor children (HCSO 2011).

Hungarians of Transylvania, Szilágyi (2004) formulates perhaps most figuratively why it is actually difficult to measure the national identity of certain persons, especially children born in mixed-ethnic partnerships, with census questions. Most of us clearly know what our ethnicity and our mother tongue is, we know the answer to this without thinking, same as we know if we are officially married or not, whether we smoke or not. But this choice is not easy for children born in mixed-ethnic partnerships, or for those who change languages for some reason, or for those who live in areas where the process of ethnic assimilation is already prevalent, or for those who simply "do not live like a Roma" in Roma-majority communities (Gyenei 1993: 28). It is not at all clear to them what to answer in a given situation. This problem, to some extent, can be helped by allowing multiple choices of ethnic identity, as was done during the 2001 and 2011 censuses in Hungary.

The literature analysing the racial and ethnic affiliation of children born in mixed-ethnic partnerships also tries to explain the factors influencing the parents' choice of one or another identity along two hypotheses. The *assimilation hypothesis* assumes that the more the generation of parents is assimilated or integrated into majority society, the more their children will be reported to have majority identities, in this type of mixed-ethnic partnerships (Xie and Goyette 1997). For example, in situations where the size and proportion of the minority is low compared to the majority, there is a pressure from the majority to assimilate the minority people and it is also attractive for the minority to belong to the majority population (Szilágyi 2002, 2004, Kiss 2016). The *awareness* or *ethnic competition hypothesis*, in turn, states that the ethnic awareness of minorities increases when they come into contact with the majority society. This leads to conflicts, a competitive situation in which the minority further protects its identity or privileged position (Xie and Goyette 1997, Finnäs and O'Leary 2003), or because it feels demographically threatened (Bruce 1992), so their children are more likely to be raised and reported to have minority identities.

In both hypotheses, parental education plays a key role. Following the assimilation hypothesis, educated parents would classify their children as majority nationalities (because those with higher education have a higher chance of assimilation and integration). According to the awareness hypothesis, it is the parents with higher levels of education who transfer their minority identity more, especially at a higher level of ethnic hierarchy within a given area - such as Swedish speakers in Finland or Protestants in Ireland (Finnäs and O'Leary 2003). For example, in the case of children born in mixed-ethnic partnerships between 1976 and 1980, Swedish parents with higher education were 3.1 times more likely to register their children as Swedish-speaking than those with low educational attainment (Finnäs and O'Leary 2003). However, in the case of mixed-ethnic partnerships in the United States or in the case of Hungarian - Romanian mixed-ethnic partnerships in Transylvania, Romania, the proportion of minority children is lower among parents with higher education. Even when the minority party is the high-educated party, 14 percent of children in African American and white partnerships are African American, 22 percent of children in Native American-white relationships are Native American, and 8 percent of children in Asian-white relationships are Asian and in Hispanic-white relationships, 12 percent of children were Hispanic ethnic, according to data from the 2008-2014 American Community Survey (Lichter and Quian 2018).[8] And the highly educated Hungarians from Transylvania in mixed-ethnic partnerships were also less likely to categorize their children as Hungarians, compared to Hungarians with a low level of education, in 1977 (24% vs. 32%), in 1992 (27% vs. 33%) and in 2002 (30.6% vs. 31.2%; Kiss 2016), too.

8 48–74 percent of children born in such mixed-ethnic partnerships were registered by parents as mixed-ethnic in the survey (Lichter and Quian 2018).

That said, these choices in Transylvania, Romania, depend to a large extent on the ethnic spatial structure, as the more someone lived in a Hungarian-inhabited area, the more they categorized their child as Hungarian (Kiss 2016). And they also depend on which parent, mother, or father is of ethnic minority or majority (Xie and Goyette 1997; Lichter and Quian 2018). Some authors have assumed that since children usually bear their father's name, it can be assumed that they will then inherit the father's ethnicity along with the surname (Waters 1989). However, the mother tongue can be associated with the language of the mother and, closely related to it, the mother's ethnicity, and the fact that many believe that mothers have a greater responsibility in raising children also suggests that the mother's ethnicity may be more authoritative in influencing the child's ethnicity (Wilson 1981, Xie and Goyette 1997). However, the empirical data show the following. In Catholic-Protestant mixed marriages in Ireland, 75 percent of children were christened Catholic if the mother belonged to the Catholic majority and the father to the Protestant minority. And in Sweden, 69 percent of children were registered as Swedish-speaking if the mother belonged to the Swedish-speaking minority and 40 per cent of the children if the father was Swedish-speaking (Finnäs and O'Leary 2003). Conversely, in the American Community Survey data mentioned above, 18 percent of children became African American if the father, and only 11 percent, if the mother was African American; the same proportions for Native American-white mixed marriages were 23 and 24 percent, respectively; 9 and 7 percent for Asian-white mixed-ethnic partnerships, and 17 and 14 percent for Hispanic-white mixed-ethnic partnerships, respectively (Lichter and Quian 2018). Similar to these distributions, in Romanian-Hungarian mixed-ethnic marriages in Transylvania, Romania, 34 percent of children were registered as Hungarian if the father was Hungarian and only 28 percent if the mother was the Hungarian party (Kiss 2016).

METHODOLOGICAL BACKGROUND

MEASUREMENT OF ETHNIC IDENTITY IN THE 1990, 2001, AND 2011 NATIONAL CENSUSES

We analyse the 1990 and 2011 census data as the 2001 census data cannot be used for our purpose in a comparative manner. It is true that ethnic identity was inquired in all three censuses, but with different data collection techniques: in 1990, one question was posed to everyone, on a compulsory basis. In 2001 and 2011, it was voluntary to answer, but while in 2001 there were three answer options for a single question without indicating which participants considered to be their primary, secondary and tertiary ethnic identity, in 2011 there were two individual questions, the first asking about the respondents' primary, and the second of the secondary ethnic identity.[9] Thus, when making a *temporal comparison* of the demographic behaviour of the Roma population, we can only compare the figures from 1990 to those figure from 2011, that identify Roma people in connection to the first nationality question (Mouranszki and Papp 2014, Kapitány 2013, 2015). That is, when we make a comparison over time, we compare the 142.6 thousand Roma in 1990 to 130.5 thousand Roma in 2011 (Table 1). When we do not make any temporal comparison, but we only describe the marital and fertility behaviour of Roma population, we use only the 2011 census data and we employ a broader definition - and a larger number of people - of Roma: we consider the individuals who answered either on the first or on the second nationality question as Roma (the number of Roma people is 308.9 thousand in this case, see Table 1, last column).[10]

Table 1
Number of Roma and non-Roma people in 1990, 2001, 2011 national censuses, Hungary

Total population	1990	Total population	2001	Total population	2011(1)	2011(1,2)
Roma	142,683	Roma (first or second or third mention)	189,984	Roma as primary identity	130,596	130,596
				Roma as secondary identity		178,361
Non-Roma	10,232,140	Non-Roma	9,437,794	Non-Roma	8,351,385	8,166,398
		Missing data	570,537	Missing data	1,455,647	1,462,273
Total	10,374,823	Total	10,198,315	Total	9,937,628	9,937,628

Source: 1990 and 2011 censuses. Own calculation and HCSO (2001).

However, measuring Roma identity is still a complex issue (Durst 2006, 2017; Ladányi and Szelényi 1997, 1998, 2004; Kemény et al. 2004; Kemény 2000, Havas et al. 1998; Kertesi 1998). During his anthropological studies, Szuhay (2005) indicates, too, that Hungarian Gypsies are not unified, rather, there are many different subgroups. Several studies have indicated that the triple division among the Roma, by language use (Romungros, Oláh Gypsies, and Beas, as articulated by Kemény et al. 2004, Kemény 2000) does not cover the reality either, as several dialects can be found among Beas, for example. These subgroups and tribes differentiate themselves from each other, and, in many cases, they do even

9 See: Szabó et al (2020), Appendix 2, pp. 27.

10 Of the 130.5 thousand people who marked their first ethnicity as Roma, 60 percent (78,811 people) were those who had only reported Roma ("monoracial"), and 40% (51,785 people) also reported to have had a second ethnic identity, almost always Hungarian, i.e., they were in fact of mixed ethnicity. Those who chose Roma as a secondary ethnic identity, 98.8 percent of them reported to have been Hungarian in the first place.

not marry each other. Due to insufficient numbers, we cannot separate the different Roma subgroups within the census data, so despite their distinct partnership formation, childbearing and childrearing habits and different economic and social situation, we are forced to analyse the data, as it were referring to one unified group.

Additionally, in the case of the 2011 census data, we are also aware of the fact that our analysis and conclusions do not apply to the whole Roma population living in Hungary in 2011, but only to those who identified themselves as Roma in the census. The proportion of those who did not declare their ethnic identity is high at 14.6%. In addition, it cannot be ruled out that some Roma people reported themselves to be of ethnic Hungarian when they were asked by interviewers, as they did not want to confess their Roma identity. And in addition to all this, it is also conceivable that the interviewers, without asking the respondents, marked the person as a Roma based on appearance (Tánczos 2012).

MEASURING MIXED-ETHNIC PARTNERSHIPS

The prevalence of mixed-ethnic marriages and partnerships can be measured, on the one hand, based on cross-sectional census data. These represent the so called stock data and show how many people live in an endogamous (similar ethnicity) or exogamous (different ethnicity) partnership at a given time, i.e., at the time of the census. These indicators can be calculated at the partnership level (for all partnerships, or only for partnerships where at least one party is a minority) and at the individual level, i.e., what percentage of men and women of the same ethnicity live with a couple of the same or different ethnicity. On the other hand, it can be measured using marriage register data; these are so-called flow data, and these can indicate what percentage of marriages are between parties of the same or different ethnicities. The literature denotes the latter, incidence-like measurement, as the more accurate one (as opposed to the previous prevalence-type measurements based on cross-sectional data) if we want to make a comparison over time (Kalmijn 1998), as it shows mixed marriages among the total new entrants to the marriage market, which means that the population measured at each period is also distinct. The Hungarian register data do not include the ethnicity of the parties to the marriage (nor do they provide data on cohabiting partnerships), therefore, we must rely on census data when measuring mixed-ethnic partnerships. Thus, with prevalence measures from cross-sectional data, we underestimate the prevalence of mixed-ethic partnerships, as those individuals are missing who are no longer registered as living in a union. Either because after a while, the parties in such mixed-ethic partnership may become similar to each other, i.e., they may change ethnic identities, "taking up" the ethnicity of their partner; or because they have already divorced, or broke-down their mixed-ethic partnership (due to different cultural habits, mixed-ethic partnerships are more likely to break up, Finnäs 1997, Kalmijn et al 2005, Dribe and Lund 2011, Kiss 2016). To reduce these biases, the present analysis focuses on Roma couples in which *women are 30 years of age or younger*, assuming that at such a young age, women may still be in their first marriage or union and might likely have relatively low divorce rates. And also, assuming that these new/recent partnerships were initiated geographically at the same place (at the same marriage/partnership market) where the parties lived at the time of the census (others did the same in their analyses in order to eliminate selection biases from cross-sectional data: Quian and Lichter 2001, Gullickson 2006 Bukodi 2001, Bessudnov and Monden 2020, Quian 1997).

In our analysis, we consider ethnically endogamous partnerships in which both parties declared themselves to be of the same ethnicity (Roma or non-Roma); and mixed-ethnicity or exogamous partnerships, where one party declared to be of Roma and the other of non-

Table 2
Distribution of people living in partnerships by their ethnicity

		Woman		Total
		A. Roma	B. Non-Roma	
Man	A. Roma	a	b	Rm
	B. Non-Roma	c	d	NRm
Total		Rw	NRw	N

Notes: the content of the "non-Roma" group varies depending on the analytical context. When we make a temporal comparison between 1990 and 2011, we use the meaning (1), i.e., non-Roma = non-primary Roma. When we analyse only the 2011 census data with the broader definition of Roma, we use the meaning (2), i.e., non-Roma = did not mention Roma either as their primary or as their secondary ethnicity. Non-Roma can also be Hungarian, Serb, Romanian, etc.

Roma ethnicity. To measure the mixed-ethic partnership specific indicators, we present a partnership table (Table 2), which shows the nationality distribution of the parties in a partnership.

We calculate the following ratios from this Table 2 (Kalmijn 1998). At the partnership level we can calculate

(1) the proportion of mixed-ethnic partnerships out of all relationships: (c+b) / N;

(2) the proportion of the endogamous partnerships among Roma couples (at least one party is Roma): (a)/(a+b+c) and

(3) the proportion of exogamous partnerships among Roma couples (at least one party is Roma): (c+b) / (a+b+c).

At the individual level we can calculate

(4) the percentage of Roma men (a/Rm), and percentage of Roma women (a/Rw) living in an endogamous partnership; and

(5) percentage of Roma men (b/Rm), and percentage of Roma women (c/Rw) living in an exogamous partnership.

However, these ratios are significantly influenced by the size and composition of groups, so analysts use *odds ratios* to measure ethnic endogamy to separate the effects of their indicators from the size of the given groups (Kalmijn 1998). Using the notations in Table 2, the odds ratio is calculated as follows:

(6) in terms of men: (a/b) / (c/d), and (7) in terms of women (a/c) / (b/d). Logically, these two values are equivalent.

Thus, in fact, the odds ratio proportionates two odds: the odds that a Roma man will marry/couple a Roma woman, as opposed to marrying a non-Roma woman, and the odds that a non-Roma man will marry/couple a non-Roma woman, as opposed to marrying a Roma woman. To put it simply, this odds ratio shows the likelihood of a Roma man to marrying a Roma woman, as opposed to marrying a non-Roma woman. If it is greater than 1, there is greater ethic endogamy among Roma compared to the others, and the higher its value, the greater the degree of endogamy. As already noted, this indicator is independent of group size. In many cases, the logarithmic value of the odds ratios is plotted because large-scale, long-scaled values are easier to plot and review in this way.

MEASURING ETHNIC REPRODUCTION

In a mixed-ethnic partnership, ethnic reproduction is ensured if half of the children follow the ethnicity of the father and the other half follow the ethnicity of the mother, i.e., if the distribution of children born into such families, by ethnicity, is 50-50 percent. Then, within mixed-ethic partnerships, losses and gains would offset each other. However, this is not usually the case, the status hierarchy and differences in prestige between

nationalities, the social context, discrimination can all influence how the parents define their children's ethnic identity, if they have a choice.

To calculate ethnic reproduction from census data, we proceeded as follows. As the children living in families are (also) members of the total population enumerated during the census, their main demographic characteristics are also recorded, such, e.g., their role in the family (husband/wife, partner, single parent, child, ascendant, etc.), age and ethnic identity. Data for children under 18 are to be provided by parents. However, there is no data in the census on whether the child is a biological or foster child of adults/parents in the family.[11] We performed our analysis by taking into account these methodological limitations.

As a first step, we selected families with at least one *mother - child relationship* (with or without a father). We were able to do this because in the census database, all *persons living in a family* at the time of the census are identified with the same family-identifier number, and the position of the persons in the family is also indicated with another variable, i.e., role in the family. In both the 1990 and 2011 censuses, by definition, *families* are considered to be married or cohabiting couples, with or without children; or single parents with children (with either a biological or foster child). A *child,* by definition, is considered to be the child of a person, if he or she does not form an independent family, regardless of his or her age, marital status and whether he or she has his or her own means of subsistence. Thus, for every person living in a family we know their partnership status (married or cohabiting), role in the family (husband/wife, spouse, single father/mother, child), gender, age, and ethnic identity. On the other hand, we do not know that a woman living in a family is the biological mother or (only) foster mother or caregiver of a child who lives in that family. Therefore, in the second step, we further narrowed the range of selected families: only those families were considered *that had at least one child aged 5 or younger*, and we assumed that these children aged 5 years or younger were the biological children of women from that family. This is because we have to account for ever-born children to define female reproduction. Thus, finally, we have a database of families in which we know the ethnicity of women/mothers and their children aged 5 or younger (and we also know the ethnicity of the husband/partner if they live in the family). From this data, we can already calculate the *total number of children* of Roma women (this will be considered as biological reproduction) and the *number of children* of Roma nationality (this will be considered as ethnic reproduction). At the same time, there are also some families in this database where the women/mothers are not Roma, but the children were reported as Roma, i.e., we can also get an idea of the ethnic reproduction gain.[12]

The ethnic reproduction of Roma women can be calculated by comparing the number of Roma children to the total number of children of Roma women. Roma children, as mentioned, could be born not only from Roma mothers, but also from non-Roma mothers, so we must also take this into account in the calculation. That is:

$$ER_t = \frac{(R_{T_{ch}} - R_{NR_{ch}} + NR_{R_{ch}})_t}{R_{T_{ch_t}}} \qquad (8)$$

where ER_t indicates the ethnic reproduction rate, measured at time *t*; $R_{T_{ch_t}}$ indicates the total number of children of Roma women at time *t*; $\cdot R_{NR_{ch}}$ indicates the number of non-Roma children of Roma women at time *t* (i.e., ethnic loss); and $\cdot NR_{R_{ch}}$ indicates the number of Roma children of non-Roma women at time *t* (i.e., ethnic gain).[13]

11 The number of ever live-born children of mothers are also recorded in the census, but there is no information on the ethnic identity of these children, so we cannot use these variables in our analyses.

12 The vast majority of them were cited to have Roma fathers.

13 Individuals whose ethnic identity was unknown were not included in the analysis, by default. Nevertheless, we performed hypothetical calculations by estimating the missing data (Appendix A3), from which the ethnic reproduction coefficients under different scenarios can be calculated.

RESULTS

ENDOGAMOUS PARTNERSHIPS

As a first step in the analysis of Roma partnerships, we selected individuals from the 1990 and 2011 individual-level census databases who were married or in a cohabiting partnership at the time of the census and whose ethnicity was known. Then we selected those partnerships in which at least one of the parties declared themselves to be Roma: in 1990 we counted 27.7 thousand and in 2011, 28.9 thousand Roma couples (or 65.1 thousand, if we work with the extended definition of Roma in 2011, Table 3). As a final step, we further narrowed the population to only those partnerships where the woman was 30 years of age or younger in order to reduce the selection bias resulting from long-term residual mixed-ethnic partnerships and those exiting their mixed-ethnic partnership over time (see Methodological Background). The number of partnerships with women aged 30 or younger living in Roma partnerships was 12.6 thousand (2.7%) in 1990 and 10.1 thousand (5.0%) in 2011 (or 22.5 thousand, 11%, if we work with the extended definition of Roma in 2011).

Table 3
The number of partnerships, 1990, 2011

	Change in time		2011(1,2)
	1990	2011(1)	
All partnerships	2,446,299	1,842,028	1,842,028
Roma partnerships	27,796	28,932	65,166
Roma partnerships, %	1.1%	1.6%	3.5%
All partnerships, where woman is 30-years old or younger	461,737	204,524	204,524
Roma partnerships, where woman is 30-years old or younger	12,632	10,124	22,572
Roma partnerships, where woman is 30-years old or younger, %	2.7%	5.0%	11.0%

Source: 1990 and 2011 censuses. Own calculation.
Note: Roma partnership = partnership, where at least one of the parties is Roma. 2011 (1): only Roma of the primary ethnicity; 2011 (1,2): primary or secondary ethnic Roma.

Table 4 summarizes how these Roma partnerships are distributed when viewed from the women's and men's individual perspectives. In 2011, 85.2 percent of Roma women and 83.2 percent of Roma men lived in endogamous partnerships, when we consider the extended definition of Roma population (Table 4).

Looking at *change over time* between 1990 and 2011, the proportion of people living in endogamous partnerships decreased among both Roma women and Roma men: from 84.8 to 83.2 percent among women and from 86.5 to 79.8 percent among men (Table 4). Among men, this decline was so large that it even reversed the gender gap, so that by 2011, already a smaller proportion of Roma men live in endogamic partnerships than women. 98-100% of non-Roma men and women live in endogamous partnerships. Concludingly, between 1990 and 2011, a decrease in the proportion of Roma men and women living in endogamic partnerships is observable. Not only percentage distributions but also odds ratios indicate a decrease in endogamy between 1990 and 2011 (Table 4, last column).

Thus, 80 to 87 percent of Roma men and women have lived in endogamous partnerships in the past 20 years. The question is, how do these percentages develop when we also look at the parties by age groups or education? We explore this in Tables 5 and 6. Let us first look at the parties by age groups (Table 5).

Table 4

Proportion of endogamous partnerships by sex of peers and odds ratio of endogamous partnerships, 1990, 2011

		Women		Men		log(OR): odds ratio of endogamous partnerships
		Distribution of women aged 13–30 by ethnicity	% of endogamous partnerships among women	Distribution of men by ethnicity	% of endogamous partnerships among men	
Change in time	1990					
	Roma	88.3%	84.8%	86.6%	86.5%	3.2
	Non-Roma	11.7%	99.7%	13.4%	99.6%	
	2011(1)					
	Roma, primary	82.6%	83.2%	86.1%	79.8%	2.7
	Non-Roma	17.4%	99.1%	13.9%	99.3%	
2011(1,2)						
Roma, primary or secondary		85.3%	85.2%	87.4%	83.2%	2.5
Non-Roma		14.7%	98.2%	12.6%	98.5%	

Source: 1990 and 2011 censuses. Own calculation.
Note: 2011 (1): only Roma of the primary ethnicity; 2011 (1,2): primary or secondary ethnic Roma.

Table 5

Proportion of endogamous partnerships by ethnicity, gender and age group of peers, 1990, 2011

		Change in time						2011(1,2)		
		1990			2011(1)					
		N	With Roma partner n	Endogamous partnership %	N	With Roma partner n	Endogamous partnership %	N	With Roma partner n	Endogamous partnership %
Roma women	13–20 years old	2885	2447	84.8	1913	1674	87.5	4207	3782	89.9
	21–30 years old	8267	7006	84.7	6450	5284	81.9	15,044	12,625	83.9
	Total	11,152	9453	84.8	8363	6958	83.2	19,251	16,407	85.2
Roma men	13–20 years old	1322	1099	83.1	939	770	82.0	2004	1705	85.1
	21–30 years old	6975	6064	86.9	5298	4306	81.3	11,934	10,047	84.2
	31–40 years old	2489	2170	87.2	2208	1698	76.9	5152	4184	81.2
	40y+ years old	147	120	81.6	274	184	67.2	638	471	73.8
	Total	10,933	9453	86.5	8719	6958	79.8	19,728	16,407	83.2
Non-Roma women	13–20 years old	46,104	473	99.0	12,155	359	97.0	9861	665	93.3
	21–30 years old	404,481	1007	99.8	184,006	1402	99.2	175,412	2656	98.5
	Total	450,585	1480	99.7	196,161	1761	99.1	185,273	3321	98.2
Non-Roma men	13–20 years old	9338	157	98.3	3784	88	97.7	2719	133	95.1
	21–30 years old	270,580	960	99.6	92,035	768	99.2	85,399	1489	98.3
	31–40 years old	162,957	501	99.7	91,083	463	99.5	88,139	999	98.9
	40y+ years old	7929	81	99.0	8903	86	99.0	8539	223	97.4
	Total	450,804	1699	99.6	195,805	1405	99.3	184,796	2844	98.5

Source: 1990 and 2011 censuses. Own calculation.
Note: The proportion of non-Roma living in an endogamous partnership, means that their partner is also non-Roma. 2011(1): only Roma of the primary ethnicity; 2011 (1,2): primary or secondary ethnic Roma.

Both among Roma women and men and non-Roma women and men, there is a high proportion of those who have a partner belonging to the same ethnicity. The rate of endogamous partnerships is higher among young Roma men and women than among older individuals (in 2011(1,2)): while the proportion of those living in endogamous relationships is 85.1% among the youngest Roma men, it is 73.8% among the oldest. Among Roma women, the appropriate figures are 89.9% and 83.9%, respectively. The situation is the opposite among the non-Roma: there is a lower proportion of younger people living in endogamic partnerships than older people. If we look at the share of endogamous partnerships, we may consider the higher proportions among juvenile Roma to be a sign of a reactive form of identity; while among non-Roma juveniles we can witness an openness towards the Roma. However, if we look at the more reliable log-odds ratios (Table 7), we can see that its value is somewhat lower in the youngest age group (2.0) than in the older ones (2.1).

Looking at change over time we see that proportion of people living in ethnically endogamous partnerships decreased in all age groups between 1990 and 2011, regardless of gender and ethnicity, with one exception. The exception is the group of Roma women under the age of 20: the proportion of those living with a Roma partner increased between 1990 and 2011 (from 84.8 percent to 87.5 percent). If we look at a more reliable indicator of time trends, the log-odds ratios, it is clear that ethnic endogamy decreased among Roma under the age of 20 between 1990 and 2011: from 2.5 to 2.3 (Table 7/Panel A).

We also analysed the proportion of Roma men and women living in endogamous partnerships, by educational attainment. Several correlations emerge from Table 6.

Regardless of the period: it is true both among Roma men and women that the higher their level of education, the less likely they are to be in an endogamous partnership. While for non-Roma men and women, the correlation is reversed: the higher their level of education, the likelier that they are living in an ethnically endogamous partnership (more precisely: not with a Roma partner). That is, higher educated Roma are more ethnically open (or better accepted, or less likely to find a Roma partner who also has a high level of education); while the higher educated non-Roma are more closed in terms of ethnically mixed partnerships. That said, this correlation is not as strong among non-Roma as among Roma.

Consider, for example, the behaviour of non-Roma men in 2011: 95.3% of those with a primary education and 99.6% of those with at least a high school diploma had an endogamous partnership. For Roma men, the same proportions were 86.1% and 62.4%, respectively (Table 6, last column). However, there are also gender-based differences, and these differences also change over time. While in 1990, the proportion of men living in an endogamous partnership was higher among Roma men in each educational attainment group than among Roma women with similar educational attainment, this correlation reversed by 2011 and we see that regardless of their educational attainment, a larger extent of Roma women lives in endogamous partnerships than Roma men.

Table 6

Proportion of endogamous partnerships by nationality, gender and educational attainment of peers, 1990, 2011

		Change in time						2011(1,2)		
		1990			2011(1)					
		N	With Roma partner n	Endogamous partnership %	N	With Roma partner n	Endogamous partnership %	N	With Roma partner n	Endogamous partnership %
Roma women	Primary	10,522	8999	85.5	6953	5966	85.8	15,689	13,921	88.7
	Vocational	338	235	69.5	869	629	72.4	2139	1562	73.0
	High school	81	42	51.9	471	300	63.7	1295	808	62.4
	Total	10,941	9276	84.8	8293	6895	83.1	19,123	16,291	85.2
Roma men	Primary	9482	8335	87.9	6786	5639	83.1	15,179	13,074	86.1
	Vocational	1151	877	76.2	1506	1054	70.0	3562	2680	75.2
	High school	102	64	62.7	356	202	56.7	860	537	62.4
	Total	10,735	9276	86.4	8648	6895	79.7	19,601	16,291	83.1
Non-Roma women	Primary	136,868	1202	99.1	38,787	1155	97.0	30,051	2047	93.2
	Vocational	122,841	162	99.9	33,736	292	99.1	32,466	601	98.1
	High school	190,382	95	100.0	123,490	306	99.8	122,666	662	99.5
	Total	450,091	1459	99.7	196,013	1753	99.1	185,183	3310	98.2
Non-Roma men	Primary	98,438	1191	98.8	38,158	804	97.9	29,765	1409	95.3
	Vocational	211,068	394	99.8	65,056	456	99.3	63,000	1058	98.3
	High school	140,791	80	99.9	92,444	138	99.9	91,940	365	99.6
	Total	450,297	1665	99.6	195,658	1398	99.3	184,705	2832	98.5

Source: 1990 and 2011 censuses. Own calculation.

Note: age of women: 16-30 years, age of men 16+. 2011 (1): only Roma of the primary ethnicity; 2011 (1,2): primary or secondary ethnic Roma. "Primary education" covers ISCED 1997 0-2 levels; "vocational education" covers ISCED 1997 3 level and "high school" covers ISCED 1997 4-5-6 levels.

*

These percentages provide a simple and informative overview of the proportion of Roma and non-Roma men and women choosing a partner of similar or different ethnicity, but they cannot indicate the strength of ethnic endogamy within a given group because with regards to the above-presented data there is no reference group. Moreover, we cannot ignore the fact that the population of the given gender and education groups differ significantly between 1990 and 2011 and between Roma and non-Roma. Between the two periods, the composition of the two populations according to ethnicity, age and education changed significantly. To eliminate these factors, we calculate and compare the odds ratios of partnerships within ethnicity, educational and age groups according to the usual calculations from the marriage tables (see Methodology subchapter, as well Kalmijn 1998, Bukodi 2010).

The ethnic odds ratios presented in panel B of Table 7 in each educational group indicate that, while in 1990 the group of those with vocational school had the highest ethnic endogamy, in 2011 it was highest among those with at least a high school diploma. This may also be related to educational expansion, as if the number of those with vocational education increased in 1990, it was easier for vocationally trained men (both Roma and non-Roma) to find a partner with a vocational qualification. Similarly, by 2011, the number of men and women with at least a high school diploma also increased, meaning, Roma high school graduates were more likely to find a Roma high school

graduate partner (and non-Roma people as well). It can be seen that the rate of ethnic endogamy decreased in all educational groups between 1990 and 2011, but among those with vocational education to the greatest extent.[14]

Table 7

Log-odds ratio (log (OR)) of ethnically endogamous partnerships by age groups and educational attainment of peers, 1990, 2011

A.	Change in time		2011(1,2)
	1990	2011(1)	
15–20 years old	2.5	2.3	2.0
21–30 years old	2.4	2.8	2.1

B.	Change in time		2011(1,2)
	1990	2011(1)	
Primary	2.6	2.3	2.0
Vocational	3.4	2.5	2.2
High school diploma	3.2	3.0	2.6

Source: 1990 and 2011 censuses. Own calculation.
Note: Under panel B, age of women: 16-30 years, age of men 16+. 2011 (1): only Roma of the primary ethnicity; 2011 (1,2): primary or secondary ethnic Roma. "Primary education" covers ISCED 1997 0-2 levels; "vocational education" covers ISCED 1997 3 level and "high school diploma" covers ISCED 1997 4-5-6 levels.

MIXED-ETHNIC PARTNERSHIPS AND FACTORS THAT AFFECT THE LIKELIHOOD OF THEIR FORMATION

In the chapters so far, we have reviewed the relationships in which the parties were of the same ethnicity: either both Roma or both non-Roma. Now, conversely, we look at the ratio of mixed-ethnic partnerships and the ratio of those living in mixed-ethnic partnerships. In 2011, 27.3 percent of Roma "couples" were mixed-ethnic couples (Table 8, last column). A higher proportion of Roma men lived in mixed-ethnic partnerships than Roma women (16.8% vs 14.8%). Analysing the change between 1990 and 2011 (and working with the narrower definition of Roma in 2011, in order to ensure comparability over time), we obtained results that are in line with the previous ones: the proportion of mixed-ethnic partnerships has increased in the last 20 years (from 25.2 to 31.3 percent).

The proportion of people living with a partner of another ethnicity increased among both Roma men and Roma women, but while it was barely 1.6 percentage points among Roma women, it increased by 6.7 percentage points among Roma men. Among Roma men, this proportion increased mainly among the vocationally trained (from 24 to 30 percent) and high school graduates (from 37 to 43 percent).[15]

14 It is not the subject of our present analysis, but it is an interesting question of how *educational* homogamy and endogamy developed within different ethnic groups (Roma and non-Roma). The calculated values are presented in Annex A1 and A2, in corresponding tables. As others have also indicated (Quian 1997), odds ratios show a U-shaped association, or more J-shaped in case of the Roma. That is, the value of odds ratios is the lowest among those with a vocational qualification, while it is higher among those with primary education and those with at least high school diploma. These correlations actually obscure the fact that those with a vocational education attainment are more likely to "marry" both upwards and downwards, as opposed to those with the lowest and highest qualifications, respectively. Roma couples with at least a high school diploma have a higher rate of educational homogamy, than that of Roma with lower levels of education. The educational homogamy decreased over time among them (while it increased among non-Roma people) between 1990 and 2011. This is presented in Annex A2, also in Table 1, in which the odds ratios calculated separately for Roma and non-Roma indicate which educational groups are closer to each other and which are located far from each other, and how this changed between 1990 and 2011. Distances between school groups decreased among Roma, while they increased among non-Roma between 1990 and 2011.

15 See data in Table 6.

Table 8
Mixed-ethnic partnerships and people living in these partnerships, by sex and educational attainment of peers, 1990, 2011

A.	Change in time		2011(1,2)
	1990	2011(1)	
Roma partnership (at least one party is Roma, N)	*12,632*	*10,124*	*22,572*
Proportion of Roma and non-Roma mixed-ethnic partnerships	25.2%	31.3%	27.3%
Roma men in mixed-ethnic partnerships	13.5%	20.2%	16.8%
Roma women in mixed-ethnic partnerships	15.2%	16.8%	14.8%
Non-Roma men in mixed-ethnic partnerships	0.4%	0.7%	1.5%
Non-Roma women in mixed-ethnic partnerships	0.3%	0.9%	1.8%

Source: 1990 and 2011 censuses. Own calculation.
Note: 2011 (1): only Roma of the primary ethnicity; 2011 (1,2): primary or secondary ethnic Roma.

But what demographic, partnership-specific and territorial factors make a Roma man more likely to choose a non-Roma woman as his partner? And for a non-Roma man to form a relationship with a Roma woman? We answered these questions by logistic regression analyses using the 1990 and 2011 census data. Under panel A of Table 9, we only analyse the partnerships of Roma men who live with Roma women or with non-Roma women. In panel B of Table 9, we analyse the partnerships of Roma women who live with Roma men or with non-Roma men.[16] The logistic regression models were constructed in a way that the first model included the demographic and partnership characteristics of the parties and the spatial variables characterizing the place of residence recorded at the time of the census: type of settlement (town or village), county (NUTS3 in Nomenclature of territorial units for statistics), and the weighted proportion of Roma per settlement.[17] In the second model, we included the interaction effect of male and female educational attainment, assuming that their combined effect may also be related to the chances of choosing to form a mixed-ethnic partnership. However, the second model did not improve the goodness of fit of the regression model: the effect of the interaction factor was not significant, meaning that both male and female educational attainment have an independent influence on whether or not individuals enter into a mixed-ethnic partnership. Therefore, in our final model, we omitted the interaction effects and based our entire analysis only on the main effects (Table 9).

Mixed-ethnic partnership between Roma man and non-Roma woman

In 1990, a Roma man had a higher chance of forming a partnership with a non-Roma woman if he was vocationally trained, if his partner also had at least a vocational education, if they lived in a cohabiting partnership, in a city, in Baranya, Békés, Csongrád, Tolna or Vas NUTS3 counties, and if the concentration of Roma in their place of residence was low. This picture did not change much in 2011, we measured the same correlations: a Roma man had a better chance of forming mixed-ethnic partnership if he was older, if he had at least vocational education, if his partner also had at least a vocational education,

16 So, in fact, instead of a multinominal regression, we ran two logistic regression analyses regarding each census year.

17 Specifically, we calculated the weighted number of Roma in census enumeration districts per settlement by multiplying the number of Roma living in each census enumeration district, by their percentage within the census enumeration district, and then dividing the sum of the multiplications per settlements, by the population of that given settlement (Szilágyi 2002, Kiss 2016). The census enumeration district is not the most ideal territorial unit, a more accurate estimates could be measured by summation per residential block of flats, but since the census enumeration district was the smallest territorial unit available in both the 1990 and 2011 census databases, we used this as the level of analysis. This weighted proportion by settlement variable actually controls for the territorial concentration of Roma within a settlement (per district).

or if they lived in county Baranya, Békés, Hajdú-Bihar, Pest, Somogy, Tolna, Vas or Veszprém, and if the concentration of Roma in their place of residence was low.

Table 9

Probabilities of mixed-ethnic partnerships, logistic regression, exp(B), 1990, 2011

	A. Mixed-ethnic partnership (Roma man & non-Roma woman)				B. Mixed-ethnic partnership (non-Roma man & Roma women)			
	1990		2011(1)		1990		2011(1)	
	Exp(B)	sign	Exp(B)	sign	Exp(B)	sign	Exp(B)	sign
Age group, man (ref: 13-20y)								
Man (21-30y)	0.847	*	0.896		1.126		1.194	
Man (31-40y)	0.863		1.066		1.616	***	1.583	**
Man (41y+)	1.225		1.561	**	4.255	***	2.399	***
Age group, woman (ref: 13-20y)								
Woman (21-30y)	0.670	***	0.920		0.772	***	1.060	
Educational level, man (ref: primary)								
Man (vocational)	1.755	***	1.484	***	2.927	***	2.318	***
Man (completed high school)	1.348		1.753	***	5.636	***	2.814	***
Educational level, woman (ref: primary)								
Woman (vocational)	4.298	***	1.932	***	1.650	***	1.513	***
Woman (completed high school)	14.435	***	3.356	***	2.708	***	1.728	***
Relationship (ref: married)								
In cohabiting partnership	1.288	***	1.106		1.202	**	1.030	
Type of settlement (ref: village)								
City/town	1.156	**	1.025		1.004		1.007	
Weighted proportion of Roma in settlement	0.070	***	0.118	***	0.162	***	0.149	***
Place of residence NUTS3/County (ref: Budapest)								
Baranya	1.533	**	1.874	**	2.875	***	1.345	
Bács-Kiskun	0.924		0.983		1.397	*	0.609	**
Békés	1.749	**	1.033		1.544	**	0.690	*
Borsod-Abaúj-Zemplén	0.690	**	0.737	**	0.864		0.458	***
Csongrád	1.677	**	1.743	**	1.476	*	0.987	
Fejér	0.952		2.004	**	1.162		0.991	
Győr-Moson-Sopron	0.860		1.829	**	1.154		0.809	
Hajdú-Bihar	1.124		1.042		1.492	**	0.614	**
Heves	0.906		0.872		0.887		0.481	***
Komárom-Esztergom	1.233		2.087	**	1.267		1.208	
Nógrád	1.179		1.450	**	1.126		0.924	
Pest	1.241		1.234		1.493	**	0.801	
Somogy	0.886		1.505	**	1.549	**	1.040	
Szabolcs-Szatmár-Bereg	1.059		0.663	**	1.219		0.436	***
Jász-Nagykun-Szolnok	0.927		0.816		1.283		0.508	***
Tolna	1.679	**	1.104		1.762	**	0.906	
Vas	1.794	*	4.348	***	2.256	**	1.492	
Veszprém	1.163		1.564	*	2.376	***	1.087	
Zala	1.069		1.636	**	1.425	*	0.854	
Constant	0.345		0.359		0.176		0.281	
Nagelkerke	0.174		0.173		0.146		0.171	
Predicted %	10.2%		16.8%		8.5%		12.7%	

Source: 1990 and 2011 censuses. Own calculation.

Note: Sign.: *** <0.000; **<0.05, *<0.10. 2011 (1): only Roma of the primary ethnicity. "Primary education" covers ISCED 1997 0-2 levels; "vocational education" covers ISCED 1997 3 level and "high school diploma" covers ISCED 1997 4-5-6 levels.

Between 1990 and 2011, the age effect (regarding men) and the effect of the territorial concentration of Roma intensified. However, the effect of educational attainment (both for women and men) decreased and the effect of the type of partnership (marriage or cohabitation) and the type of settlement (city/town or village) disappeared. While in 1990 the chance of forming a mixed-ethnic partnership among Roma men with vocational educational was 1.8 times higher than among those with primary education, in 2011 it was 1.5 times higher. Among women, the same odds ratio fell from 14.4 to 3.4 between 1990 and 2011. County effects were very complex, even if we controlled for the territorial concentration of Roma and the type of settlement of the place of residence. There are counties where Roma men are consistently more likely to form a mixed-ethnic partnership than in Budapest (where the proportion of such mixed partnerships was 26% in 1990 and 36% in 2011): in, e.g., Baranya, Csongrád and Vas counties; and some counties with a consistently lower probability, e.g., in Borsod-Abaúj-Zemplén county (and in Szabolcs-Szatmár-Bereg in 2011). The goodness of fit of the model measured by the Nagelkerke coefficient was 17.4 and 17.3 percent in 1990 and 2011, respectively, and the proportion of correctly classified cases was 10.2% and 16.8%, respectively. These not-so-high model fit rates indicate that there could be many other individual and contextual factors that may not be accounted for with these models explaining the probability of mixed-ethnic partnership.

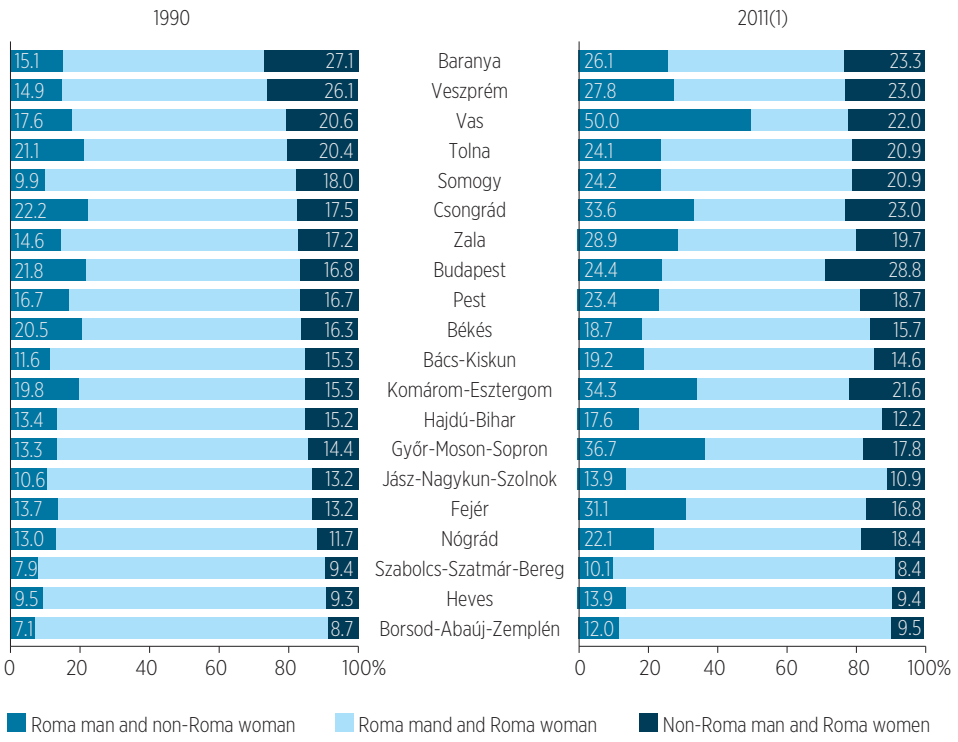
Mixed-ethnic partnership between Roma woman and non-Roma man

Examining the probabilities of the mixed-ethnic partnership of Roma women, we did not find any significant difference compared to Roma men. In 1990, a Roma woman was more likely to have a mixed-ethnic partnership if the man was older, if the man had at least vocational education, if she also had at least vocational education, if they were in a cohabiting partnership, or if they lived in Baranya, Somogy, Tolna, Vas, Veszprém and Békés, Hajdú-Bihar and Pest counties, and if the territorial concentration of Roma was low. And similarly in 2011, a Roma woman was more likely to live with a non-Roma man if he was older and more educated (at least had a vocational educational attainment) and if the Roma woman was also educated with at least vocational education; and if the concentration of Roma within the settlement of residence was low.

The role of men's age in the mixed-ethnic partnership choice of Roma women decreased between 1990 and 2011. It is interesting to note that in 1990, women entered into a mixed partnership before the age of 20 with higher probability than at age 21-30, regardless of their nationality (Roma or non-Roma). Furthermore, the higher the educational level of the parties, the more likely a Roma woman is to live in a mixed-ethnic partnership. The role of education also decreased between 1990 and 2011, and similarly to men, by 2011 the influence of the type of partnership and the type of settlement of the place of residence also disappeared, these factors no longer played a role in the decision. In 1990, the type of partnership still mattered: Roma women living in a cohabiting partnership were 1.2 times more likely to choose couples across ethic line, and Roma men were 1.3 times more likely to choose a non-Roma woman as their partner, than married couples. It is conceivable that Roma-non-Roma mixed-ethnic couples still preferred cohabitation over marriage in the 1990s because marriage would have been a family event to which the whole kinship, neighbourhood would have been invited, and perhaps, mixed couples were weary of the possibility of tensions between the two families and the meeting their wider kinship.

Comparing and summarizing the ethnic background and educational attainment of the parties in the two types of mixed-ethnic partnerships, and their impact on the probability of forming a mixed-ethnic partnership, it seems that the educational attainment of the non-Roma party, whether female or male, has a stronger influence on

this choice. The county/territorial effect appears to differ not only in terms of the type of mixed-ethnic marriage (i.e., by gender of the minority party) but also by the two census years examined. These differences may be related to the change in the proportion of different types of Roma mixed-ethnic partnerships in each county, and in the reference category, Budapest, where the proportion of mixed-ethnic marriages of Roma women within all Roma couples increased significantly between 1990 and 2011: from 16.8% to 29.5% (Figure 1). The model fit explaining Roma women's mixed-ethnic partnerships is also lower than that of models examining Roma men's partnerships, i.e., this type of partnership may be more greatly affected by other factors not analysed here, which may also be related to Roma women's place of residence.



Source: 1990 and 2011 censuses.
Note: In 2011, only those are considered Roma who marked Roma as their primary ethnicity.

Figure 1
Distribution of Roma partnerships by NUTS3 counties, 1990, 2011

ETHNIC REPRODUCTION

If both parties in a partnership are Roma, then, with a few exceptions, the vast majority of their children will also be Roma, i.e., ethnic reproduction is assured. Ethnically mixed partnerships are those that endanger (from the point of view of a given minority) ethnic reproduction, as the ethnicity of children will not necessarily equally follow the ethnicity of father and mother, but will be influenced by aspects such as the socio-political contexts prevailing in a region, a hierarchy of prestige between the ethnic groups living in the area or cultural and normative aspects specific to minorities (Kiss 2016, Kiss-Csata 2007, Veress 2014, Szilágyi 2002, 2004, Finnäs and O'Leary 2003).

The development of Roma mixed-ethnic partnerships and the factors influencing them were reviewed in the previous chapter. Now let us see what happens within such mixed-ethnic partnerships in terms of children's ethnicity: we look at the proportion of Roma women (and men) and whether they register their children as Roma or non-Roma when inquired in the censuses. We selected those mixed-ethnic partnerships which reported to have children up to the age of five. Table 10 summarizes the distribution of all children aged 5 and younger living in a family, according to their parents 'actual partnership status and ethnicity.

Table 10

Distribution of Roma and non-Roma children aged 5 or younger by parents' ethnicity and actual partnership status, 1990, 2011

	Parents / Children	Roma mother & Roma father	Mixed-ethnic partnership			Single mother		Non-Roma parents	Total
			Total mixed-ethnic part-nerships	Roma mother	Roma father	Roma	Non-Roma		
Change in time	1990								
	Roma	96.2%	39.2%	46.4%	31.1%	90.0%	0.2%	0.0%	2.9%
	Non-Roma	3.8%	60.8%	53.6%	68.9%	10.0%	99.8%	100.0%	97.1%
	N	*14,973*	*3873*	*2057*	*1816*	*3913*	*81,189*	*571,984*	*675,932*
	2011(1)								
	Roma	91.5%	27.8%	36.6%	20.7%	79.5%	0.3%	0.1%	3.2%
	Non-Roma	8.1%	67.4%	57.9%	75.1%	16.0%	93.9%	96.4%	93.0%
	no data	0.4%	4.8%	5.5%	4.2%	4.5%	5.9%	3.5%	3.8%
	N	*12,339*	*4958*	*2212*	*2746*	*2606*	*58,084*	*395,217*	*473,255*
2011(1,2)									
Roma		98.5%	38.4%	45.2%	32.7%	84.7%	0.6%	0.2%	8.0%
Non-Roma		1.2%	57.0%	49.9%	63.0%	11.4%	93.4%	96.2%	88.3%
no data		0.3%	4.6%	4.9%	4.3%	3.9%	6.0%	3.7%	3.8%
N		*28,759*	*9105*	*4167*	*4938*	*5991*	*54,699*	*374,701*	*473,255*

Source: 1990 and 2011 censuses. Own calculation.
Note: only among parents of known ethnicity; and children of unknown ethnicity are also taken into account in the distribution. 2011 (1): only Roma of the primary ethnicity; 2011 (1,2): primary or secondary ethnic Roma.

In 2011, 98.5 percent of children born to parents in Roma endogamous partnerships were registered as Roma by their parents and only 1.2 percent were registered as non-Roma. Interestingly, a small percentage of children among non-Roma couples, 0.2 percent, were said to be of Roma nationality (they may have in fact been adopted children). If, due to the comparison over time, we only consider those Roma parents and children who reported to be Roma as their primary ethnicity in 2011 (i.e., we compare the 1990 and 2011 (1) figures), then the proportion of Roma children of Roma parents decreased between 1990 and 2011: from 96.2 percent to 91.5 percent.

Columns 3, 4, and 5 of Table 10 show the distribution of children aged 5 and younger in mixed-ethnic partnerships by ethnicity. In such partnerships, the majority of children, 57 percent, were identified by their parents as non-Roma and only 38.4 percent as Roma in 2011. Looking at the change in time, we see that the proportion of children in mixed-

ethnic families identified as Roma decreased significantly between 1990 and 2011: from 39.2 percent to 27.8 percent.[18]

Several correlations can be deduced from the data in Table 10. First, let us look at the parents' gender differences. If the mother is of Roma ethnicity, the distribution of children is closer to the ideal 50-50 percent breakdown. In such families, a higher proportion of children will be of Roma ethnicity than when the father is Roma: in 1990, 46.4 percent of the children of Roma mothers were identified as Roma, while only 31.1 percent of the children of Roma fathers were identified as Roma. And in 2011, 36.6 and 20.7 percent, respectively (45.2 and 33.7 percent, respectively, if we work with the extended Roma definition). The dominant role of the mother is also clear when it comes to non-Roma parents: if the mother is not Roma, the child will more likely be non-Roma than if the father were the non-Roma party. In 1990, 68.9 percent of children of non-Roma mothers and only 53.6 percent of children of non-Roma fathers were non-Roma. In 2011, these proportions were 75.1% and 57.9%, respectively. So, when choosing the ethnicity of the child, the ethnicity of the mother seems to be more decisive.[19]

The value of ethnic reproduction rates in Roma partnerships calculated on the basis of this table are 84.5% in 1990 and 73.2% in 2011 (and 84.1% in 2011 if we work with the extended Roma definition).[20]

It is also an interesting question whether the choice of ethnicity assigned by parents to their children is related to their educational attainment: how *do high school-educated* Roma mothers and fathers decide when determining the ethnicity of their children? Do rather follow the logic of the assimilation hypothesis and report mostly to have non-Roma children or do they follow the awareness/competition hypothesis and rather report to have Roma children? We tested this question based on data from 2011, working with the extended Roma identity, i.e., being Roma based either on the first or on the second ethnicity question.

From Table 10, we have already concluded that if the mother in a mixed-ethnic partnership is Roma, the proportion of Roma children is higher than if the father were of Roma ethnicity. However, the data in Figure 2 indicate that the proportion of children registered as Roma depends on the combination of parents' gender, ethnicity, and educational attainment. The higher the level of education of the Roma party, the less likely they are to register their child as Roma.

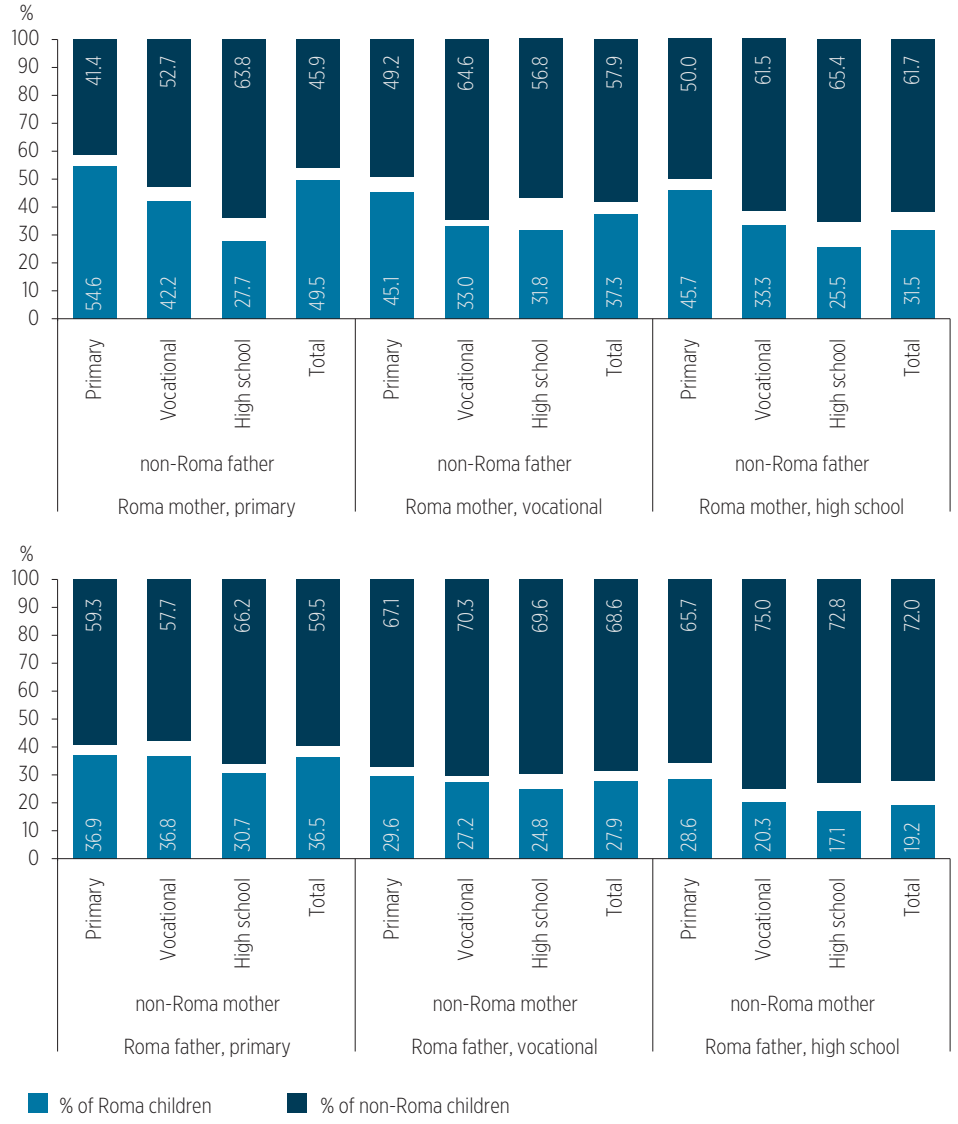
For example, while 49.5 percent of children of primary educated Roma mothers, 31.5 percent of children of highly educated Roma mothers were reported as Roma (Figure 2, upper side). While 36.5 percent of the children of primary educated Roma fathers, 19.2 percent of the children of highly educated Roma fathers were reported as Roma (Figure 2, lower side). A more educated Roma party will only have a higher proportion of Roma children if their partner has a lower level of education; and the proportion of children reported to be Roma will be the lowest if both parents have high levels of education.

That is, according to the assimilation hypothesis, highly educated Roma mothers and fathers living in mixed-ethnic partnerships report their children to be non-Roma. The highly educated parents report their children' ethnicity to be Roma in lower proportions – and, in fact, these "Roma" children have mixed, Roma-non-Roma ethnicity. The

18 In 2011, about half of the Roma-primary-nationality children have a single ethnicity (501 persons), while for the rest, a secondary nationality had been also reported by their parents. In other words, some of the children primarily reported to be Roma were in fact of mixed nationality, Roma and non-Roma (Hungarian) children. That is, in 2011, 5.5 percent of all children aged 5 or younger born to a mixed-ethnic partnership (n = 9105) were only of Roma nationality, 32.8 percent were of mixed nationality and 57 percent were non-Roma. (Non-Roma children can also have multiple identities, such as, e.g., Hungarian and Slovak, here, they are non-Roma, only in the sense that they did not mention Roma either as their primary or secondary ethnicity.) However, for the sake of comparability over time, we do not use the only Roma – mixed Roma – non-Roma categories for children's nationality, instead, we still work with the categories used so far: primary Roma – secondary Roma – non-Roma.

19 This correlation is even stronger if we only look at mothers and fathers who have a single (Roma) identity: 29.6% of the children of only Roma mothers are only Roma, and 16.6% of the children of only Roma fathers are only Roma.

20 ER = total number of Roma children / total number of children in endoganeous Roma and mixed Roma-non-Roma partnerships.



Source: 2011 census; own calculation. Note: a Roma person someone who reported himself/herself to be Roma as primary or secondary nationality. "Primary education" covers ISCED 1997 0-2 levels; "vocational education" covers ISCED 1997 3 level and "high school diploma" covers ISCED 1997 4-5-6 levels.

Figure 2

Distribution of Roma and non-Roma children aged 5 and under by parents' ethnicity and educational attainment, 2011

highest proportion of children were identified as *non-Roma* by highly educated Roma fathers with a lower educated (with vocational school) non-Roma partner (75%), similarly, to mixed-ethnic couples of black men/white women in the United States (exchange theory).

As a final step, we looked at the parental and environmental factors associated with reporting a child in a *mixed-ethnic parental family as non-Roma*: that is, when ethnic loss occurs regarding the minority party of an ethnically mixed couple (Table 11). We employed a logistic regression analysis again. The dependent variable is the ethnicity of the child: 1: if non-Roma; 0: if Roma.[21] The explanatory variables included both the main demographic characteristics of the child (gender, age) and the parents:

21 The analyses were run for all children aged 5 years or younger born to parents in a mixed-ethnic partnership, or by randomly selecting one child per family (since all children aged 5 years and younger living in the same family belong to the same parent couple), but the results and the correlations did not change. We also verified our results by first involving the ethnicity of the father and then the mother; and also, by changing the reference categories: our conclusions did not change, regardless.

Table 11

Probabilities of reporting non-Roma ethnicity for a child by parents living in mixed-ethnic partnership, logistic regression, exp (B), 2011

2011(1,2)	*Non-Roma child, %*	Model1		Model2		Model 3		Model 4		Model 5	
		Exp(B)	sign	Exp(B)	sign	Exp(B)	sign	Exp(B)	sign	Exp(B)	sign
Constant	*57.0*	1.376	***	0.707	***	0.705	**	0.706	*	1.040	
Gender of the child (Ref: boy)	*56.5*										
Gender of the child (girl)	*57.5*	1.040		1.038		1.039		1.023		1.025	
Age of child		1.009		1.009		1.009		1.013		1.015	
Nationality of mother (Ref: only Roma)	*39,3*										
Mixed-nationality mother	*53,0*			1.619	***	1.619	***	1.539	***	1.406	***
Non-Roma mother	*62.9*			2.532	***	2.252	***	2.306	***	2.263	***
Nationality of father (Ref: only Roma)	*58.7*										
Mixed-nationality father	*64.1*					1.163	**	1.138	*	1.079	
Man (Ref: 13-20y)	*60.2*										
Man (21-39y)	*58.5*							0.888		0.859	
Man (40-59y)	*50.9*							0.773		0.726	*
Woman (Ref: 13-20y)	*56.4*										
Woman (21-39y)	*58.1*							0.917		0.892	
Woman (40-59y)	*47.7*							0.750	*	0.735	**
Man (Ref: primary)	*52.6*										
Man (vocational)	*62.1*							1.591	***	1.471	***
Man (high school)	*67.9*							2.217	***	2.064	***
Woman (Ref: primary)	*53.6*										
Woman (vocational)	*61.3*							1.166	**	1.100	
Woman (high school)	*66.8*							1.309	***	1.229	**
Partnership status (Ref: married)	*59.8*										
In cohabiting partnership	*60.5*							1.043		1.042	
Place of residence (Ref: city/town)	*58.6*										
Village	*55.4*									0.850	***
Weighted proportion of Roma in settlement										0.162	***
Place of residence NUTS3 (Ref: Budapest)	*60.6*										
Baranya	*61.7*									1.646	***
Bács-Kiskun	*57.3*									1.130	
Békés	*52.7*									1.000	
Borsod-Abaúj-Zemplén	*48.0*									1.234	*
Csongrád	*67.9*									1.641	**
Fejér	*62.9*									1.714	**
Győr-Moson-Sopron	*61.5*									1.217	
Hajdú-Bihar	*49.7*									1.104	
Heves	*50.0*									1.405	**
Komárom-Esztergom	*62.1*									1.382	*
Nógrád	*57.1*									1.517	**
Pest	*54.8*									0.998	
Somogy	*64.1*									1.936	***
Szabolcs-Szatmár-Bereg	*54.0*									1.442	**
Jász-Nagykun-Szolnok	*57.3*									1.470	**
Tolna	*62.4*									1.407	**
Vas	*69.1*									2.017	**
Veszprém	*61.7*									1.321	*
Zala	*68.9*									2.056	***
Nagelkerke R Square			0.000		0.030		0.031		0.067		0.102
Predicted overall %			59.9%		61.2%		61.2%		62.9%		64.6%

Source: 1990 and 2011 censuses. Own calculation.

Note: The mother or father is of mixed ethnicity if he/she has indicated other ethnicities in addition to the Roma as primary or secondary identity. Sign.: *** <0.000; **<0.05, *<0.10.

ethnicity, age group, education, partnership status, and the territorial characteristics of the residential environment where the family lived at the time of the census (which is not necessarily identical to the area where the children were born, but the choice of identity was not made at birth but at the time of the interview, i.e., at the place of residence at the time of the census). This analysis was performed on data from the 2011 census and considered those children to be Roma who had either primary or secondary Roma ethnicity, and non-Roma, who did not have any Roma affiliation.

The goodness of fit of these extended regression models measured by the Nagelkerke coefficient is not very high but is significant: 10.2% for the most extensive model; however, the models correctly classify 60% of the cases in the regression estimates. We also checked for interaction effects, both between the parents' nationality and education, and between the two parents' education, but these factors did not increase the explanatory power of the model, nor were they significantly related to the dependent variable, so we omitted them in our final analyses. Now let's look at the results (Table 11).

Parents reported their children to be Roma or non-Roma at the time of the census regardless of their children's gender and age. The ethnicity of the parents, however, significantly relates to the identification of children: mixed-ethnic mothers are 62 percent more likely to identify their children as non-Roma than only-Roma mothers, and non-Roma mothers are 2.5 times more likely to do so than only-Roma mothers. And fathers of mixed nationalities were 16 percent more likely to report their children non-Roma than fathers of only-Roma nationality.

During the extension of the models, the influence of the mother's ethnicity is maintained throughout, the father's is reduced, to the point that in the last model it no longer proves to be significant. Of the demographic characteristics of parents examined here, the age group did not seem to have an influence on the choice, however, educational attainment did. Women with at least high school diploma were 30.9 percent more likely to report their children as non-Roma than women with primary education, while those with a vocational qualification were 16.6 percent more likely to report their children non-Roma than women with primary education. For men, the relevant odds ratios are even higher: high school graduate men are 2.21 times more likely and the vocationally trained men are 1.59 times more likely than primary educated men to identify their children as non-Roma than primary educated men.

Furthermore, whether the parties lived together in a marriage or in cohabiting partnership did not influence their choice, but the territorial variables involved did. We controlled for the weighted proportion of Roma per settlement: the higher the concentration of Roma in the given area where parents' live, the less likely their child was to be reported non-Roma. Respectively, they were even less likely to do so if they lived in villages instead of cities. In majority of the NUTS3 counties from Hungary, the children of mixed-ethnic partnership parents were significantly more likely to be considered as non-Roma than Roma. Compared to Budapest, capital city, this was most likely in Zala (2.056), Vas (2.017) and Somogy (1.936) counties.

*

Within field of studying mixed-ethnic partnerships, the literature reveals whether a child will be reported as ethnic minority or not, as both the mother's and father's ethnicity (and other individual characteristics) are important in making their choice. At the same time, if we want to calculate the *ethnic reproduction of Roma* - as our starting point was to be able to calculate an assimilation measurement for the Roma population projection - the focus is on the extent of difference in biological and ethnic reproduction, i.e., to what extent do Roma mothers report to have Roma or non-Roma children, and to what extent do non-Roma women have Roma children.

In 1990, there were a total of 543,279 families in which a mother lived with an up to 5-year-old child (as part of a couple or as a single parent); and in 2011, the number of these families was 447,485 (Table 12). These figures also indicate the number of women at the same time, as there is one woman/mother in a family. The number of Roma women in these families was 13,675 in 1990 (Table 12); and it was 11,517 in 2011 (see Annex A3, first table). And the total number of children aged 5 or younger living in these families was 675,932 in 1990; and 561,835 in 2011. As the number of non-responses was relatively high in 2011 (the ethnicity of an app. 95,000 children is unknown, see Appendix A3, first table), to calculate the ethnic reproduction rate, we first proportionate the percentage of children with unknown ethnicity to the categories of children with primary Roma, secondary Roma and non-Roma, according to the ethnic background distribution of the mother (see Appendix A3, second table). Then, mothers of unknown ethnicity were also proportionated to the known categories of mother's ethnicity, according to the combined distribution of mothers and children ethnicity (see Appendix A3, third table). After all these imputations, the number of Roma children was 19,820 in 1990 and 17,149 in 2011 (and 46,164 in 2011, if we consider the extended Roma ethnicity for children).

The ethnic reproduction of Roma women was thus 94.6% in 1990 (ER = 19,820 / 20,943); while in 2011, it was 89.5% (ER = 17,149 / 19,165).[22]

Table 12

Distribution of mothers living together in a family and their children aged 5 or younger by ethnicity, 1990, 2011

	Ethnicity of mother:			*Total*
1990	Roma		Non-Roma	
Nr of women	13,675		529,604	*543,279*
Nr of Roma children	18,881		939	*19,820*
Nr of non-Roma children	2062		654,050	656,112
Total nr of children	*20,943*		*654,989*	*675,932*

	Ethnicity of mother:			*Total*
2011 (imputed data, see Annex A3)	Roma (1)	Roma (2)	Non-Roma	
Nr of women	13,482	17,207	416,796	*447,485*
Nr of Roma (1) children	15,975	441	733	*17,149*
Nr of Roma (2) children	2012	21,706	2289	*26,007*
Nr of non-Roma children	1178	2572	514,929	*518,679*
Total nr of children	*19,165*	*24,719*	*517,951*	*561,835*

Source: 1990 and 2011 censuses. Own calculation.
Note: Roma(1): primary ethnicity is Roma, Roma(2): secondary ethnicity is Roma.

There are convincing arguments in the literature that the concept of dual identity is describing more accurate the Hungarian processes of ethnic identification, and empirical research suggests that recording multiple identities in Hungary today often describes better the reality (Bindorffer 2007, cites Kapitány 2015). Thus, we also estimated the *ethnic reproduction rate for Roma women* and children who reported their Roma ethnicity, both as their primary or secondary identity. This value is 98.3% (ER = (17149+26007) / (19165 + 24719)). According to this ratio, the biological and ethnic reproduction among the Roma was almost the same in 2011, i.e., the rate of ethnic loss was merely 1.7%.

22 See also formula (1) in the Methodological background/Measuring ethnic reproduction.

SUMMARY

The aim of our analysis was to provide an input factor for population forecast and to calculate the ethnic reproduction rate of Roma population: an indicator that shows the extent to which the Roma minority living in Hungary can ensure its survival, or if it cannot, to calculate the loss which appears as a surplus on the balance of the ethnic majority population. We interpret the concept of ethnic assimilation from a demographic point of view, and consider assimilation to be any process in which the size of population and/or reproduction of the Roma population decreases in favour of the majority, non-Roma population (Szilágyi 2002, 2004). Since the ethnic loss – as we can measure through census data - occurs primarily in the context of mixed-ethnic partnership, in the first step of our analysis we reviewed the prevalence of Roma partnerships and then calculated the proportion of children identified by their parents as Roma is such unions. Finally, we calculated the ethnic reproduction rate measured among Roma women.

In 2011, nearly three-quarters of Roma partnerships (in which at least one party was Roma) were endogamous: that is, both parties defined themselves as Roma (73%), while a quarter defined themselves as mixed-ethnic couples (27%). The proportion of Roma men in mixed-ethnic partnerships is slightly higher (15%) than that of Roma women in such partnerships (13%). If we work with a narrow definition of the Roma population in 2011, that can be used for temporal comparison (Roma are those who identify their primary ethnicity as Roma), we find that the proportion of mixed-ethnic partnerships increased between 1990 and 2011, from 25 percent to 31 percent. Thus, the openness between Roma and non-Roma groups has increased over time. And, as indicated by our multivariate analyses, the chance to enter in a mixed-ethnic partnership also increases with increasing age and educational attainment.

In a mixed-ethnic partnership, ethnic reproduction will be ensured if children follow 50-50 percent of their parents' ethnic distribution, but this is generally not the case. In Roma-non-Roma mixed partnerships, the ethnicity of the children follows the ethnicity of the mother and not of the father: while 45 percent of the children of Roma mothers, only 33 percent of the children of Roma fathers were identified by the parents to be Roma. These rates vary according to the parents' gender, ethnicity, and educational attainment: the higher the educational attainment of Roma mothers and Roma fathers, the less likely they are to report their child as Roma. We tend to conclude that our results do not reinforce the awareness/competition, but rather the assimilation hypothesis. Roma parents who have already achieved a relatively higher level of education do not report mostly their children to be Roma or of Roma-Hungarian mixed ethnicity, but often to be non-Roma. As if in their opinion, being "Roma" also means to be an indication of lower social status, and as they break out of this low social status through higher education, they believe that because their children are already at a higher level within the social hierarchy, they are no longer to be seen as Roma. Multivariate logistic regression results, in which we examined what factors increase the likelihood in a family where the parents are of different ethnicities *not* to identify their child as Roma at all, confirmed the bivariate results. Parents in a mixed-ethnic partnership were more likely to identify their child as non-Roma, if their Roma identity was 'weaker' (if they identify themselves as having mixed ethnicity), if they had higher level of education, if they lived in a city, and it was lower the concentration of Roma in their place of residence, or if they lived in another county compared to capital city, Budapest.

The ethnic reproduction within Roma mixed-ethnic partnerships was 84 percent in 2011; that is, 84 percent of children born in such families, will be of Roma ethnicity. Although the literature mostly analyses ethnic reproduction within mixed-ethnic partnerships, we calculated this value for all Roma women, too, regardless of whether they are in a partnership or bare children as a single parent, as our starting point was

to disclose how different the biological and ethnic reproduction of Roma women are. The ethnic reproduction of Roma women was 98.7% in 2011.

If we look only at those Roma women and their children who consider themselves primarily (as their first identity) Roma in 2011, then among these women with a stronger Roma identity, the ethnic reproduction loss is 10%, which is twice as high as the 1990 reproduction loss, which was only 5%. Based on these calculations, we conclude that a process of demographic ethnic assimilation is taking place in Hungary in mixed-ethnic Roma partnerships and among Roma women.

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APPENDIX

Table A1

Changes in educational homogamy and heterogamy log-odds ratios among Roma and non-Roma, between 1990 and 2011

Among Roma	Change in time		2011(1,2)
	1990	2011(1)	
Primary	7.25	4.75	5.25
Vocational	6.64	3.36	3.63
High school	32.20	13.04	14.93

Among non-Roma	Change in time		2011(1,2)
	1990	2011(1)	
Primary	6.26	15.61	*12.67*
Vocational	2.52	3.33	*3.31*
High school	7.91	11.72	10.11

Source: 1990 and 2011 censuses. Own calculation.

Note: age of women: 16-30 years, age of men 16+. Homogamy by education is highest among high school graduates and lowest among those with vocational school. The educational homogamy is higher among Roma high school graduates than among non-Roma high school graduates. While homogamy by education among Roma decreased between 1990 and 2011, it increased among non-Roma, especially among those with primary education.

Table A2

Changes in homogamy and heterogamy by education log-odds ratios among Roma and non-Roma, 1990–2011

Roma			
1990	Woman		
	Primary	Vocational	High school
Man			
Primary	1		
Vocational	6.9	1	
High school	52.4	9.1	1

Non-Roma			
1990	Woman		
	Primary	Vocational	High school
Man			
Primary	1		
Vocational	3.5	1	
High school	37.0	5.1	1

Roma			
2011(1)	Woman		
	Primary	Vocational	High school
Man			
Primary	1		
Vocational	3.9	1	
High school	23.6	3.9	1

Non-Roma			
2011(1)	Woman		
	Primary	Vocational	High school
Man			
Primary	1		
Vocational	5.3	1	
High school	87.1	6.3	1

Roma			
2011(1,2)	Woman		
	Primary	Vocational	High school
Man			
Primary	1		
Vocational	4.3	1	
High school	28.3	4.7	1

Non-Roma			
2011(1,2)	Woman		
	Primary	Vocational	High school
Man			
Primary	1		
Vocational	4.4	1	
High school	65.3	6.2	1

Source: 1990 and 2011 censuses. Own calculation.

Note: age of women: 16-30 years, age of men 16+. If there are two women (*i, j*) and men (*i, j*) with different educational attainments, the odds ratio is calculated using the formula (nij/njj) / (nji/njj) (Kalmijn 1988, Bukodi 2010). The odds ratio, thus, proportionates two odds: the odds of an i-educated man choosing an i-educated woman instead of a j-educated woman; and the odds of an j-educated man choosing an i-educated women instead of a j-educated one. The values in the table can be read as follows, for example: in 2011, Roma women with primary education were 23.6 times more likely to have a partnership with a Roma man with also a primary education than a Roma man with a high school diploma. Among non-Roma, this odd ratio was 87 times, in 2011

Table A3

Distribution of mothers and children living together in the family by ethnicity; original distribution and distribution after imputation of missing cases, 2011

	Nationality of mother:				
First table: 2011, original distribution	Roma (1)	Roma (2)	Non-Roma	No response	Total
Number of women	11,517	14,699	356,041	65,228	447,485
Roma (1) number of children	14,322	398	640	81	15,441
Roma (2) number of children	1749	19,002	1936	165	22,852
Number of non-Roma children	988	2173	420,362	4220	427,743
Number of children of unknown ethnicity (NR)	410	359	22,052	72,978	95,799
Total number of children	17,469	21,932	444,990	77,444	561,835
Second table: 2011, imputed of NRs	Roma (1)	Roma (2)	Non-Roma	No response	Total
Number of women	11,517	14,699	356,041	65,228	447,485
Roma (1) number of children	14,666	405	673	1405	17,149
Roma (2) number of children	1791	19,318	2037	2861	26,007
Number of non-Roma children	1012	2209	442,280	73,178	518,679
Total number of children	17,469	21,932	444,990	77,444	561,835
Third table: 2011, imputed of NRs	Roma (1)	Roma (2)	Non-Roma		Total
Number of women	13,482	17,207	416,796		447,485
Roma (1) number of children	15,975	441	733		17,149
Roma (2) number of children	2012	21,706	2,289		26,007
Number of non-Roma children	1178	2572	514,929		518,679
Total number of children	19,165	24,719	517,951		561,835

Source: 1990 and 2011 censuses. Own calculation. Note: Roma (1): first ethnicity is Roma, Roma (2): secondary ethnicity is Roma. NR = non response.

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