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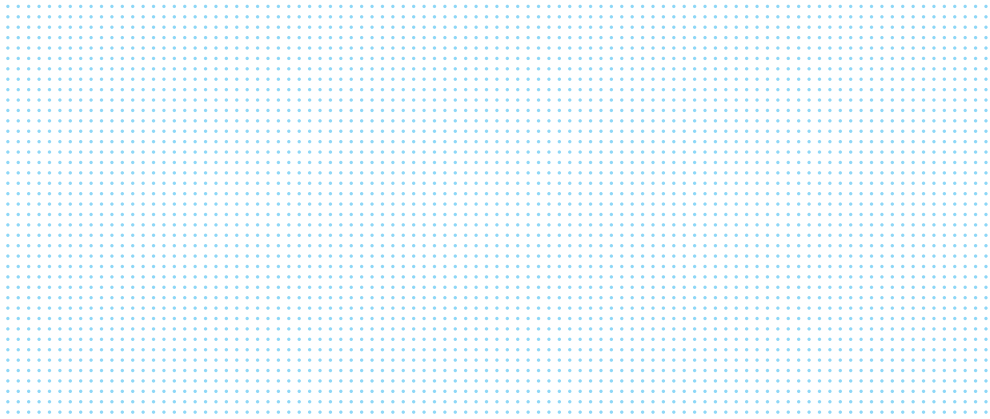

## № 34

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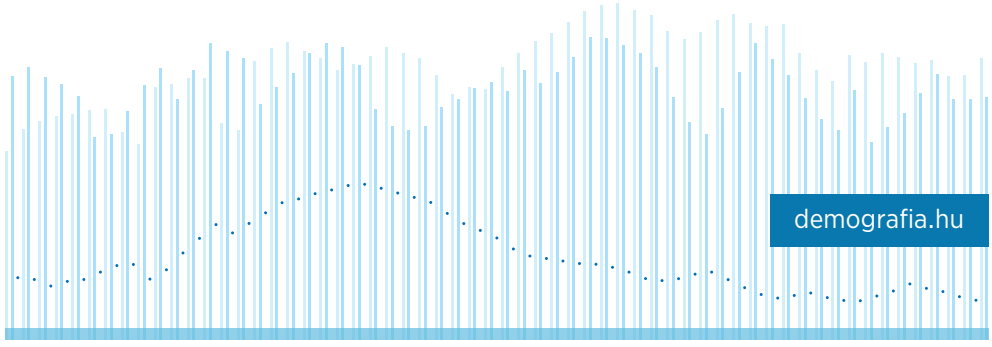
by
Laura Szabó – Igor Kiss – Branislav Šprocha – Zsolt Spéder



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## ABSTRACT

Our paper describes the specific fertility behaviour of the Roma population from four of the five countries of Central and Eastern Europe with a large Roma minority: Hungary, Romania, Serbia and Slovakia. We present the fertility behaviour of the Roma and the ethnic-majority population according to cohorts and related education in an international comparison, and show the relationship between fertility and ethnic residential segregation in Hungary.

Using individual-level data from the 2011 population censuses, we compare the mean number of children according to cohort, ethnicity, education and residential segregation. The mean number of children ever born to Roma women is far above the majority population's average for all birth cohorts and in each country. Completed education and cohort fertility are basically inversely related, regardless of country of residence, ethnicity and birth cohort. However, exposure to the ethnic-majority population affects fertility in both the Roma and the majority population, but in different ways, depending on level of education, in Hungary. Completed education and residential segregation may exert different forces at the two ends of society: at the upper end of the social hierarchy, neither segregation nor ethnicity matters; at the lower end, both exposure to ethnic majority behaviour and ethnicity matter.

Fertility in the Roma population is clearly higher than in the ethnic-majority population, and is similar across the four countries examined. Educational attainment has a robust impact on Roma fertility in each country, and the case of Hungary shows that exposure to majority behaviour also counts.


**Keywords:** Roma, fertility, education, residential segregation

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## 1. INTRODUCTION

There is total consensus among both experts and the general public that the fertility of the Roma population is high, and is indeed higher than that of the majority population among whom the Roma live as a minority (*Kalibova* 2000; *Kemény and Janky* 2003; *Vano* 2002; *Vano* and *Haviarová* 2003; *Šprocha* 2017). However, the figures are often estimates (*Hablicsek* 2007; *Vano* 2002) and frequently come in for criticism – either due to limitations regarding identification of the Roma population or because of over-generalization of the results of small-scale (anthropological) studies that carry out in-depth analysis in geographically well-defined areas (*Durst* 1997, 2006; *Husz* 2011; *Preda* 2010). Furthermore, the estimates are frequently to all intents and purposes inaccessible to an international audience, since papers are often written in the (less widely understood) vernacular languages (*Havas; Kemény; Kertesi* 1998; *Berevoescu et al*. 2002*; Zamfir* and *Preda* 2002; *Kemény* and *Janky* 2003; *Janky* 2005; *Durst* 2006; *Hablicsek* 2007; *Husz* 2011; *Šprocha* 2017; *Šprocha* and *Ďurček* 2017; *Dupcsik* 2018; *Obádovics et al*. 2019). Working on the assumption that census data are the best – most suitable and reliable – for analysing fertility behaviour across ethnicity in Central and Eastern Europe (CEE), we present the development of the fertility behaviour of the Roma population compared to the majority population.

It is common in fertility research to interpret the development of fertility in international comparison, as this allows for a better exploration of general and specific trends. However, it is rare for an investigation to analyse the fertility behaviour of the Roma population in international comparison (one exception is *Kalibova* 2000) or to raise the question of whether there is a difference in the fertility behaviour of the ethnic-majority and the ethnic-minority populations across countries. In other words, how similar is the behaviour of the Roma minority in different societies with a non-Roma majority? Since we were able to extend our study to four CEE countries (Hungary, Romania, Serbia, Slovakia), we can also analyse minority–majority relations in an international comparison and help to answer the above question using descriptive data.

It is known that fertility behaviour is influenced – and differentiated – by a number of factors (for an overview, see *Balbo; Billari; Mills* 2013); given that ethnicity is a definite factor, the question arises of whether social determinants influence the ethnic majority and the Roma minority in the same way. Do the same factors differentiate Roma fertility behaviour? We are able to examine two factors closely. The impact of the level of education will be presented in international comparison; however, the relationship between fertility and territorial-ethnic segregation can only be shown for Hungary. The results of the joint examination of these two factors may contribute to the discussion of the role of structure and culture in the minority (Roma) population (*Forste* and *Tienda* 1996).

We proceed as follows. First, we provide a concise overview of the literature related to minority fertility. We focus on literature that discusses behaviour in minorities that have been present in a country for several generations (*Goldscheider* and *Uhlenberg* 1969; *Sly* 1970; *Haug; Courbage; Compton* 1999), rather than on the (exponentially growing) literature on migrant fertility, since that would stretch the framework of our analysis. Next, we summarize the results of sociological and anthropological analyses of the fertility of the Roma population. There then follows a data and methodology section, where we show the identification of variables and the construction of measures. The results related to differences in fertility between the ethnic-majority and the Roma-minority population, across cohorts and educational attainment, are reported in international comparison. After considering the importance of minority segregation, the joint effects of educational attainment and segregation are examined. We conclude with a discussion of the results and with a note on the limitations of our contribution.

## 2. APPROACHES TO THE FERTILITY BEHAVIOUR OF MINORITIES

People belonging to different ethnic-minority groups in the United States (Black, Irish, Jewish, Japanese) have long shown fertility behaviour that is distinct from the majority White population (*Goldscheider* and *Uhlenberg* 1969; *Sly* 1970; *Kennedy* 1973; *Ritchey* 1975; *Johnson* 1979; *Johnson* and *Nishida* 1980). Similarly, ethnic minorities in the former Soviet Union exhibited distinct – usually higher – fertility from the Russian majority population (*Urlanis* 1974, 1980; *Borisov* 1976 (quoted in *Andorka* 1978), and the same is true in today's Russia (*Zakharov* 2008, 2017; *Archangelskiy* 2019). The remaining differences in the behaviour of ethnic minorities basically follow three avenues of thinking.

(1) The higher fertility of minorities is often understood as a lag in fertility transitions related to modernization or to their disadvantaged social structural status. Thus, primarily *social characteristics* are identified as being responsible for ethnic differences in fertility behaviour (*Sly* 1970; *Day* 1984). This hypothesis adopts the perspective of modernization/long-term assimilation: a minority will converge with the majority population, but the pace of change depends on the social characteristics of the minority members. Highly educated people will be the first to adapt their fertility to the majority behaviour (*Johnson* 1979). However, empirical research has found some contradictions here: namely, highly educated African Americans with the same social characteristics as the White majority population show an even lower level of fertility than the highly educated majority population (*Goldscheider* and *Uhlenberg* 1969).[1]

(2) As a response to these new findings, *Goldscheider* and *Uhlenberg* (1969) developed the *minority group status* hypothesis. This concept states that members of a minority group experience greater barriers to social mobility, and therefore the prerequisite for successful mobility is the investment of resources in social mobility and at the same time the limitation of fertility (since higher fertility requires additional resources). On the other hand, in conditions of deprivation, where there is very limited chance of mobility, fertility may be high because the members of the minority may expect that children will improve their social and economic prospects or will provide insurance against potential discrimination (*Chabé-Ferret* and *Ghidi* 2013). *Ritchey* (1975) then suggested a modification to this concept. He stressed that the social context of individuals should be taken into consideration, rather than just those individuals' characteristics. Thus, majority–minority relations should be included in the model to explain fertility differentials. He proves empirically that the fertility of a minority is lowest when high-status minority groups live in a very unequal ethnic context and in adverse structural-assimilation conditions (*Ritchey* 1975).

(3) The *cultural explanation* stresses that different cultures favour particular family-formation and reproductive patterns. Although socio-economic characteristics may explain certain differences in fertility behaviour, significant differences remain (*Goldscheider* and *Uhlenberg* 1969; *Kennedy* 1973; *Day* 1984; *Andorka* 1978, 1987). Although the exact mechanisms are not easy to identify, some efforts have been made to shed light on how culture may affect fertility behaviour (*Forste* and *Tienda* 1996; *Wilson* and *Kuha* 2018). On the one hand, individual attitudes are influenced by exposure to the normative environment (which is related to proximity). On the other hand, culture (ideals, norms, expectations) may also exert an influence via proximate determinants of fertility – sexual behaviour, contraceptive use, partnership formation, marital patterns. *Wilson* and *Kuha* (2018), testing the childhood socialization hypothesis, prove, for example, that migrants who come to a country as children and are early on exposed to

1 Nor does it fit the *social characteristics* explanation that the fertility level of the Jewish population living in the United States was generally lower than the level of fertility of Protestants and Catholics, irrespective of their social characteristics (*Goldscheider* and *Uhlenberg* 1969).

the cultural norms of the host society are less likely to have completed fertility that differs significantly from the native-born population. *Kulu* and *Hannemann* (2016a) show that the elevated total fertility among certain UK-born minorities (Pakistani, Bangladeshi) is due to relatively high second-, third- and fourth-birth rates. These authors also report a significant variation in the partnership patterns of immigrants in five selected European countries (*Kulu* and *Hannemann* 2016b). Immigrants from countries with a more 'conservative' family pattern (e.g. from Turkey, South Asia) have high marriage rates, low (premarital) cohabitation levels, and are less likely to separate; meanwhile more 'fluid' family-formation patterns are dominant in some non-European immigrant groups (e.g. Caribbean people, Sub-Saharan Africans and Latin Americans). Researchers on the former Soviet Union have also found important and stable ethnic differences, after controlling for individuals' social status (*Andorka* 1978, 1987); they postulate that these differences were produced by cultural factors.

Our analysis is not able to test empirically any of the three concepts mentioned above, since our census data cover a limited number of factors; moreover, cross-sectional data are very limited in their ability to reveal causal relations. However, the two factors we trace – level of education and degree of segregation of the minority – are powerful elements in understanding fertility behaviour. Level of education is a key socio-economic characteristic that strongly determines labour market success and material well-being (although we should note the endogeneity problem between education and fertility). The interaction index that we employ in our paper captures the essence of exposure (*Tátrai* 2011): it is seen as a measure of exposure to minority or majority normative environments, and therefore acts as a proxy for cultural influences. Our findings on the influences of the two factors and our comparison of the four countries may illustrate some features of the above approaches.

# 3. REVIEW OF ROMA FERTILITY

## 3.1. ROMA FERTILITY COMPARED TO SOCIETY AS A WHOLE

Estimates for the fertility behaviour of the Roma population in CEE countries are based either on census or on survey data or small case studies. Documenting differences in the fertility behaviour of the Roma population of Bulgaria, the Czech Republic, Hungary, Romania, Slovakia, Slovenia and the former Yugoslav Republic of Macedonia, using national censuses from 1990 to 1994, *Kalibova* (2000) found that Roma fertility is approximately double that of the overall population in the countries examined.

According to research directed and carried out by *István Kemény* in 1971, 1993 and 2003, which investigated the structural position of Roma in Hungarian society by means of a large-scale survey and which used the 'labelling' definition – in other words, with ethnic identity defined by the neighbourhood/community *(Kemény* and *Janky* 2003; *Janky* 2005) – the total fertility rate (TFR) of the Roma population was around 3.0 in 1999–2002, while overall Hungary's TFR was 1.3. Using census data, *Hablicsek* (2007) estimated a Roma TFR of 3.12 for the year 2001. According to our current estimates, based on 2011 census data, the fertility rate of Roma is double that of the non-Roma population (2.60 and 1.31, respectively).

*Šprocha* (2017) confirmed a significant difference in fertility between the Roma and the non-Roma population in Slovakia, too: the cohort fertility of Roma women born in the second half of the 1960s is around 3.5, while among non-Roma it is 2.1.

*Sobotka* (2008) shows that, in most age categories, the mean number of children born to Roma women in the Czech Republic exceeds the number of children born to all women by a factor of 2 or more. Roma women born before 1952 had 5.3 children on average, compared to 2.1 for the total population. Among the younger age groups, due to early childbearing of the Roma, fertility rates are more pronounced. Roma women aged 20–24 had 1.3 children on average, compared to 0.2 children among all women of that age.

For Bulgaria, *Koytcheva* and *Philipov* (2008) compared fertility in the Roma and Turkish ethnic groups to that of the majority population, and estimated that in 2000 the TFR in the Bulgarian ethnic majority was 1.1, compared to 2.1–2.3 for Turks and around 3.0 for Roma women.[2]

*Durst* (2006) conducted a small-scale anthropological case study in Hungary in the early 2000s. In a Roma-majority settlement, the fertility rate of Roma, measured by the crude fertility rate, was three and a half times the fertility rate of the total population (34.8‰, compared to 9.7‰, *Durst* 2006: 54). However, in a neighbouring settlement – where local Roma had been more integrated for decades – their fertility was significantly lower than among those living in the segregated settlement (*Durst* 2006: 178).

## 3.2. DIFFERENCES ACROSS THE ROMA POPULATION

Studies devoted to understanding the population process of the Roma minority highlight differences across the community that are ascribed either to social-geographic factors (such as type of settlement or degree of segregation) or to structural features.

*Social-geographic differences, segregation*

Representative studies in Hungary find territorial differences within the Roma population: in north-east Hungary, the TFR within the Roma population was around 2.6 in 2001, whereas in south-west Hungary (another part of the country with an above-

2 We do not report findings of fertility behaviour outside Central and Eastern Europe (see, for example, *Aisa; Andaluz; Larramona* 2017).

average Roma population), the TFR was 2.1 (*Husz* 2011). The small-scale ethnographic study mentioned above that focused on two settlements stresses the importance of segregation: whereas in a predominantly Roma settlement, the fertility among fully segregated Roma was 3.28, among less-segregated Roma the figure was 3.18; and in a neighbouring settlement where Roma had been well integrated for decades, fertility was clearly lower (3.00) (*Durst* 2006).

Analysis of the Slovak population also highlights the close relationship between territorial segregation and fertility: the Roma population living in segregated and economically backward settlements has far higher fertility than the national average (*Šprocha* and *Bleha* 2018). In 2002, the TFR in the Slovak Republic generally was 1.19, and it was 3.1 for the total Roma population; but the TFR of integrated Roma was 1.3, of partially integrated Roma it was 3.0, and of segregated Roma: 4.6 (*Potančoková et al*. 2008: 990). *Šprocha* and *Ďurček* (2017) showed that there are also relatively significant differences in cohort fertility between Roma women living in urban and rural areas in Slovakia, in the west - east of the country, as well as in smaller and larger municipalities (*Šprocha* and *Ďurček* 2017:111).

*Battaglia; Chabé-Ferret; Lebedinski* (2017) investigated the difference in fertility across neighbourhoods within the Roma population of Belgrade, Serbia. They found that fertility depends on the concentration of the Roma in a given neighbourhood: in neighbourhoods with few Roma, there are 2.7 children per household; in neighbourhoods that are mostly Roma, the figure is 3.2; and in totally Roma neighbourhoods: 3.6.

*Structural factors*

Explanations that seek to use degree of segregation and relate that to fertility often point to such factors as low economic activity, high non-employment and below-average education. *Durst* (2006) – who also focused on segregation, using a stratified survey[3] to investigate poverty – recognized the effect of education as well. She maintained that the difference between Roma and non-Roma depends largely on whether or not the women have completed primary education (i.e. eight classes of schooling). If they have not, then among Roma the mean number of children is 3.66 and among non-Roma 2.65. Considering those who have completed at least primary education, both Roma and non-Roma have the same average number of children (2.21). According to our calculation, based on the 2011 census data, level of education has a very strong association with fertility, especially at the lower end of the spectrum: while Roma women with a low level of education (completed primary schooling or less) have a TFR of 2.79 in 2010, those with vocational education or above have a TFR (1.79) that is below the replacement level. The corresponding TFR figures for all women living in Hungary are 1.81 and 1.21, respectively (*Obádovics et al*. 2019).

Although a case study by *Preda* (2010) of southern Romania reports on territorial inequalities within the Roma population, the description of the communities is related to the structural position (dominant occupation) of the Roma. She found communities from southern Romania – from the woodworker, brick-maker and bear-tamer clans – with very high fertility (more than four children per family); all these clans were very poor, with low levels of education, existing on social welfare, and with poor future prospects. There were other Roma communities with a moderate fertility rate (2–3 children per family) – including members of the coppersmith, woodworker, bear-tamer, brick-maker and silversmith clans – who lived in an urban environment, had slightly more education than their counterparts in rural areas and had a number of income-generating opportunities available to them in the urban setting.

3 The sample size of the database 'Poverty ethnicity, gender' was 603 (*Durst* 2006: 32).

## 4. DATA AND METHODS

*Census data*

Our analysis is based on individual data from the 2011 national population and household censuses in four selected countries for which data were available (Appendix 1). In three of those countries – Hungary, Slovakia and Serbia – calculations were based on the entire population; but in the case of Romania, only the 10% IPUMS sample (*IPUMS* 2018) was available to us. As far as we can assess, the Romanian IPUMS sample was representative in terms of cohort, ethnicity and education. Shortcomings in the census data are not discussed here, but there is one important observation that should be made: in spite of the fact that the question on the number of children was compulsory (i.e. not voluntary as the sensitive questions for example in some countries), 8.6% of women aged 30–59 in Slovakia did not answer the question, rising to 12.1% of Roma women (see also Appendix 5).

*Identifying the Roma: theoretical approaches and technical problems*

The literature essentially covers two ways of defining the Roma population: some approaches are based on declared identity (*self-identification*); others rely on outsiders (*external classification*).[4] The 2011 population and housing censuses in Hungary, Slovakia, Romania and Serbia employed self-identification, and so our analysis uses this classification.

There were certain technical differences in the wording of the nationality/ethnicity question. Whereas in Slovakia, Romania and Serbia, citizens had to select a single nationality with which they identified, in Hungary the option existed to select a secondary identity (Appendix 2). In the case of Hungary, we used the primary national/ethnic identity only when comparing the four countries; when we analysed the relationship between residential segregation and fertility, we used the secondary identity to categorize the Roma population as well (Appendices 2–3).[5]

Different countries took different approaches to the question on ethnicity/nationality: whereas in Slovakia it was compulsory, in Hungary, Romania and Serbia it was not. The figures for missing data on the ethnicity/nationality questions are 3.5% in Serbia, 6.2% in Romania, 7.1% in Slovakia and 14.7% in Hungary (Appendix 1).

*Fertility measures*

Our key variable is the number of children ever born to women from specific birth cohorts. We opted for this measure in order to track social differences and changes over time, and to gauge whether a decline in fertility is also traceable in the Roma population. When looking at country differences, the ratio of childless women from different birth cohorts is also presented. As the question on the number of children ever born was compulsory in the censuses, there are no missing values for this variable in the Hungarian, Romanian or Serbian databases, but there are sizeable missing values for Slovakia (as mentioned above). Fertility indicators are calculated on the basis of the information women give about children.

4 Without going into detail, we would only mention here that in Hungary around the turn of the millennium there was fierce debate on questions such as who is Roma, how to identify Roma people, and whether ethnic or national categories may be defined objectively on the basis of origin (*Durst* 2011; *Dupcsik* 2018; *Ladányi* and *Szelényi* 2002; *Havas et al.* 1998). The self-declared nationality definition is distorted by the fact that the identification depends not only on the respondent's identity, but also on the historical and political context and on perceived discrimination. Furthermore, contextual factors are also present if an interviewer identifies someone as Roma, while other circumstances distort the identification of Roma 'labelled' by outsiders.

5 According to our assessment, the fertility of primary- and secondary-identity Roma women does not differ (Appendix 6).

*Birth cohort and age*

To overcome selectivity based on the life expectancy of the Roma population (*Obádovics et al.* 2019: 30), we limit our analysis to women aged 30–59 in 2011 (i.e. born between 1952 and 1981), living in Hungary, Slovakia, Romania and Serbia in 2011 (Appendix 1). In line with the usual age categories, we grouped the women into six birth cohorts: 1952–1956; 1957–1961; 1962–1966; 1967–1971; 1972–1976; 1977–1981. Women born between 1952 and 1971 have (almost) completed fertility, since it is very rare to give birth after the age of 40 (*Frejka* and *Sardon* 2003). The two youngest birth cohorts, featuring women born between 1972 and 1981, are still far from having completed fertility, but it is worth considering them when we look at country differences, as it is possible to detect differences between Roma and non-Roma women from the youngest cohorts.

*Level of education*

Completed education is measured at the time of the census. Three main groups were distinguished: 'primary', corresponding to lower secondary education or less (ISCED 1997, 0–2); 'secondary', corresponding to higher secondary and post-secondary non-tertiary education (ISCED 1997, 3–4); and 'tertiary' – university education (ISCED 1997, 5–6). We are aware of the endogeneity–exogeneity problem when considering the relationship between completed education and fertility indicators. Here, in our analysis, we take the educational variable as an exogenous variable and use it as an indicator of the socio-economic background of the respondent.

*Residential segregation – exposure to majority context*

Aware of the modifiable areal unit problem (*Musterd* 2005) – i.e. using administrative or statistical areas to measure the level of segregation taking a single-scalar approach – we use a measure of segregation that defines neighbourhoods as groups of individuals who reside in close proximity to a focal individual, rather than who reside within some administrative boundary. In the 2011 Hungarian population census, this neighbourhood is the so-called 'residential block' where people live. We measure the exposure of Roma people to the majority population as the share of the Roma population within the total population of the residential block. Based on the ratio of the Roma population within the residential blocks, we grouped the population into four residential segregation groups.

# 5. RESULTS

## 5.1. THE DIFFERENCE BETWEEN THE FERTILITY OF THE ROMA AND THE MAJORITY POPULATION

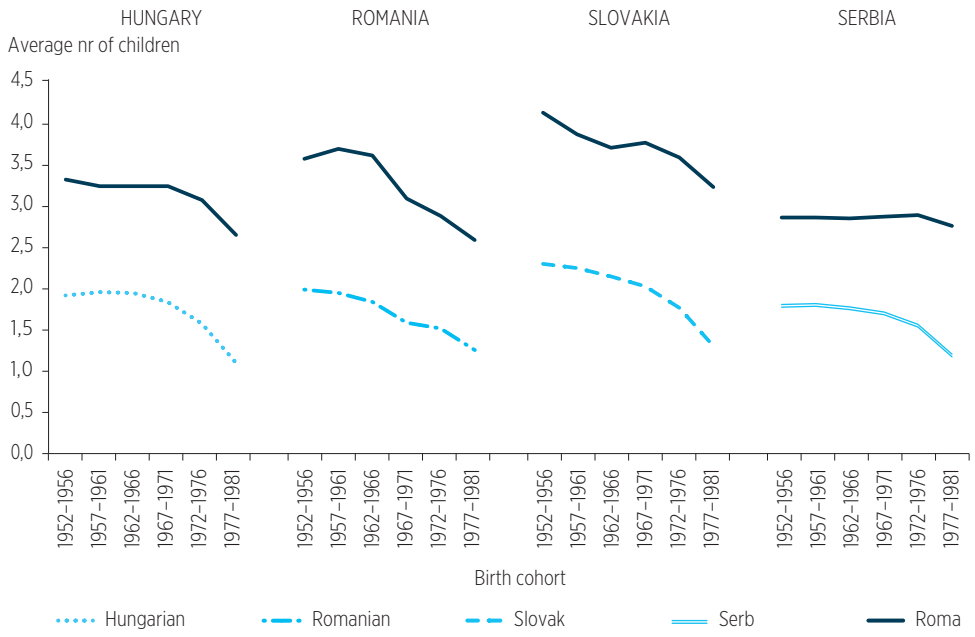
The fertility trends of (post-communist) countries before and after the fall of communism is well known and well documented (*Sobotka* 2011; *Frejka* 2008). As we know, Slovakia and Romania had relatively high fertility; but following the transition, a plunge in fertility characterized all four countries. The trend is also clearly visible when we use our measure, the mean number of children by cohorts: when we compare the oldest cohorts (born between 1952 and 1956), figures range from 2.29 (Slovakia) to 1.83 (Serbia) (Appendix 4). This range is even smaller in the case of the youngest birth cohort (born in 1977–1981): it is between 1.09 (Hungary) and 1.30 (Slovakia) among those aged 30–34 at the time of the 2011 census.

When we split the data by ethnicity, the deep division between Roma and the majority population is clearly visible. The average number of children ever born to women of Roma ethnicity is far above the majority population's average in all birth cohorts and in every country (Fig. 1a). Furthermore, the share of childless Roma women is below the majority population's share in three out of the four countries (Fig. 1b). The exception is older cohorts in Slovakia, where the childlessness of women with completed fertility is the same for Roma and ethnic-majority women.

There are some differences among the countries and cohorts regarding the average number of children. Considering only those cohorts that had completed their fertility, the average number of children born to Roma women is a minimum of 1.6 times and a maximum of 1.9 times the average number of children born to ethnic-majority women (Fig. 1a). That the fertility measures of the majority populations are very similar is not surprising, since under communism the societal and economic conditions of fertility were pretty much the same,[6] and all the countries experienced the difficult transition to a market economy, which rapidly led to postponement and low fertility. What is more striking is that the fertility behaviour of the minority Roma populations in the four countries is far more similar to one another than it is to the behaviour of the respective majority population. (However, the Slovak figures may be distorted by the fact - in both Fig. 1a. and 1b. - that in the census many Roma women from the older cohorts would not reveal the number of children they had ever had, Appendix 5). There are some variations: for instance, the Roma in Serbia have had a consistently lower level of fertility, with little change over time; meanwhile, in the other three countries, Roma completed fertility seems to have declined over time.

Looking at trends of childlessness, we see much less change in the fertility behaviour of Roma than of the ethnic-majority population, especially if we consider the younger cohorts (Fig. 1b). Early childbearing is still characteristic of Roma, and therefore cohort completed fertility is clearly dependent on their stopping behaviour (i.e. whether they stop having children in the later stages of their fertility career). Once more, if we look at childlessness, the fertility behaviour of Roma in the different countries is much more similar than is the case for the majority populations. Differentiation according to level of education and degree of segregation may provide some hints about the mechanism that produces similarities and dissimilarities.

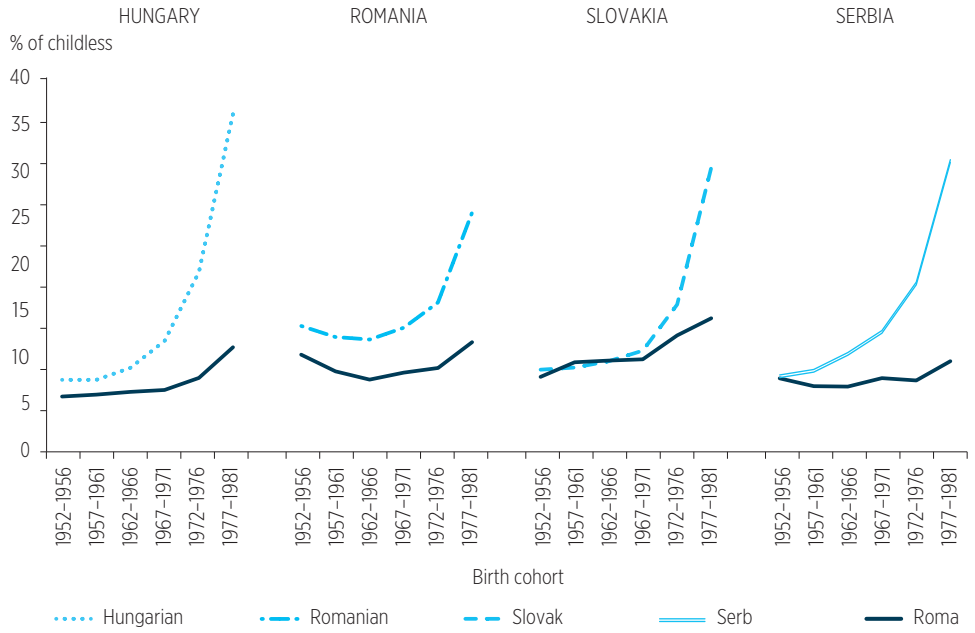
6 The coercive fertility measures in Romania introduced in 1967 are an exception: they induced higher fertility there (*Muresan et al.* 2008).




*Source:* Own calculation based on Population censuses 2011 from Hungary, Romania, Slovakia and Serbia.

Figure 1a

*Average number of children ever born, by women's nationality in selected countries, 2011*




*Source:* Own calculation based on Population censuses 2011 from Hungary, Romania, Slovakia and Serbia.

Figure 1b

*The share of childless women, by women's nationality in selected countries, 2011*

## 5.2. ROMA AND MAJORITY POPULATION'S FERTILITY, BY COMPLETED EDUCATION

If social differences are investigated, then educational gradient is a major factor (*Jalovaara et al.* 2019). The level of completed education and cohort fertility are basically inversely related in our study, regardless of country of residence, nationality and birth cohort (Figure 2a, 2b, 2c, 2d).[7] Cohort fertility is highest among the poorly educated, whether Roma or ethnic majority; and cohort fertility is lowest among the well-educated, whether Roma or ethnic majority. The correlation between educational attainment and fertility is stronger in the Roma than in the majority population, as the fertility of Roma is far higher than that of the majority population among women with a low level of education; meanwhile those Roma and non-Roma women with a high level of education have very similar fertility rates.

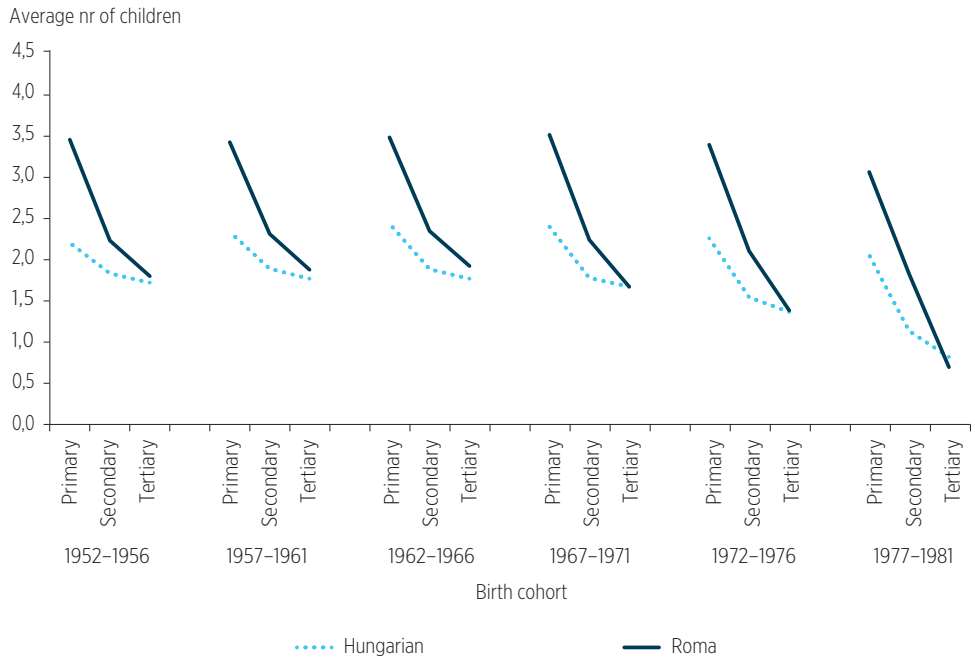
Consider, for example, the completed fertility of Roma women born between 1962 and 1966 (45–49 years old in 2011), by educational attainment in each country. Among Roma women with low and with high education, the average number of children is, respectively, 3.46 and 1.90 in Hungary (Fig. 2a); 3.83 and 1.20 in Romania (Fig. 2b); 3.86 and 2.17 in Slovakia (Fig. 2c); and 2.93 and 1.47 in Serbia (Fig. 2d). Among women from the ethnic-majority population with low and with high levels of education, the corresponding values are: 2.41 and 1.75 in Hungary (Fig. 2a); 2.53 and 1.19 in Romania (Fig. 2b); 2.69 and 1.78 in Slovakia (Fig. 2c); and 2.04 and 1.48 in Serbia (Fig. 2d). That is, in every country the difference in fertility between women with low and women with high education is greater among Roma than among non-Roma. In other words, as educational attainment increases, so the fertility gap between the Roma and the majority population narrows: the fertility of Roma women with a low level of education is far higher than that of non-Roma women with a low level of education.

In the case of the 1962–1966 cohort highlighted above, the difference between the average number of children of low-educated Roma and non-Roma women is 1.05 children in Hungary (Fig. 2a), 1.30 in Romania (Fig. 2b), 1.17 in Slovakia (Fig. 2c) and 0.89 in Serbia (Fig. 2d), in favour of Roma women. Looking at Roma and non-Roma women with secondary education, the average number of children they have is more similar than is the case for Roma and non-Roma women with primary education – across all birth cohorts and in all countries. Fertility rates are already very similar among Roma and non-Roma women with a high level of education. Moreover, the youngest (30–34) highly educated Roma women from Hungary (born in 1977–1981; 87 women) actually have rather lower fertility than highly educated Hungarian women from that birth cohort. We can see the same situation in Serbia, where once again well-educated Roma women in the birth cohorts 1952–1956 and 1972–1976 have given birth to fewer children on average than Serb women.

For Slovakia, the fertility pattern by ethnicity/nationality and education deviates from that found in the other countries. It is true that women with a high level of education have a smaller number of children than do women with a low level of education; but in some birth cohorts, well-educated Roma women have more children on average than medium-educated Roma women. We might speculate that those well-educated Roma women who refused to say how many children they had had[8] may have had a small number of children and felt uncomfortable about flouting the norms of the Roma community, which favours lots of children (and there are very few Roma well-educated women especially in old cohorts). However, here, too, we can see a convergence in cohort fertility between Roma and Slovak women with low and with high education.

7 However, we should bear in mind the low number of highly educated Roma women, especially in older birth cohorts. The number of highly educated Roma women is in the range 27–87 in Hungary, 4–24 in Romania (IPUMS 10% sample), 12–71 in Slovakia and 6–46 in Serbia, according to birth cohort.

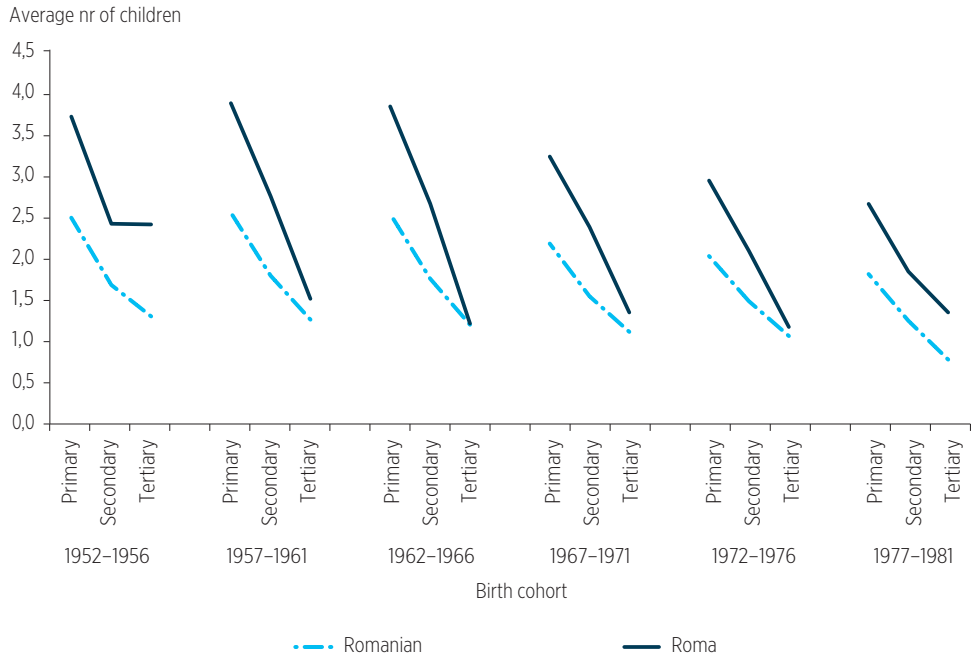
8 We discussed this topic earlier: older and better-educated Roma women failed to answer these questions in the census (Appendix 5).




*Source:* Own calculation based on Population and housing census 2011, Hungary.

Figure 2a

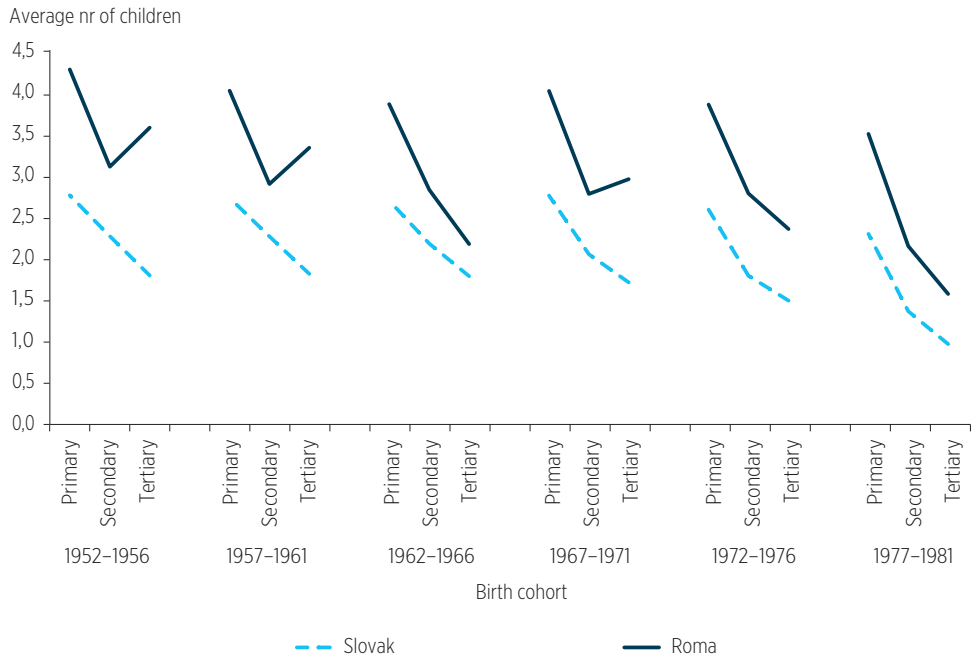
*Average number of children ever born, by women's nationality and completed education Hungary, 2011*




*Source:* Own calculation based on 10% sample of Population and housing census 2011 Romania, IPUMS–International.

Figure 2b

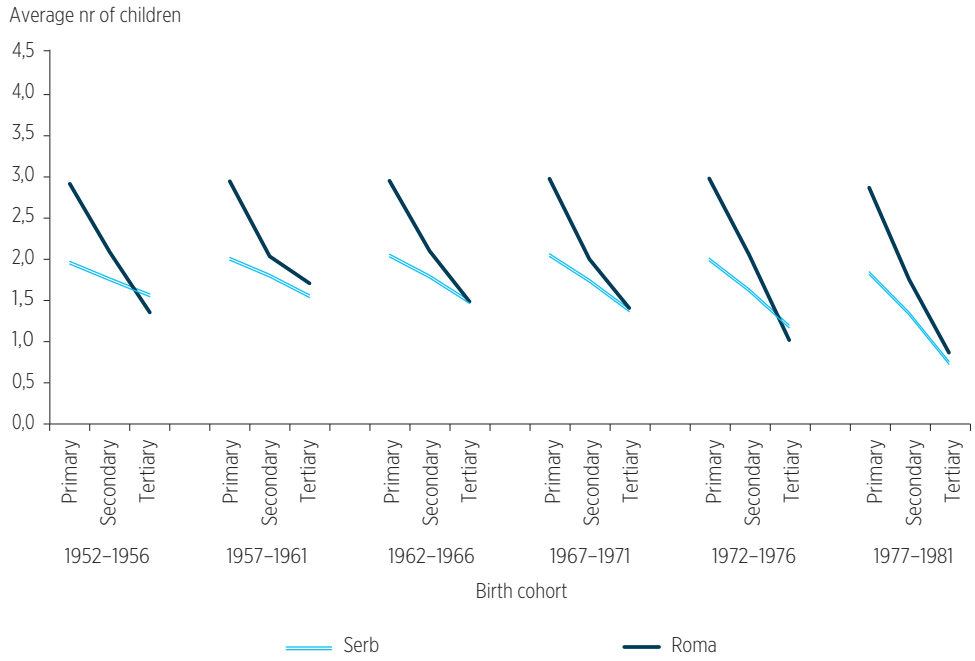
*Average number of children ever born, by women's nationality and completed education Romania, 2011*




*Source:* Own calculation based on Population and housing census 2011, Slovakia.

Figure 2c

*Average number of children ever born, by women's nationality and completed education Slovakia, 2011*




*Source:* Own calculation based on Census of population, households and dwellings in the Republic of Serbia 2011.

Figure 2d

*Average number of children ever born, by women's nationality and completed education Serbia, 2011*

It is a similar picture in Romania, although the convergence in fertility by education among women aged 30–34 and 50–59 is lacking. Without going into detail, we should mention that we were not able to track the dimension of migration, which is especially important among the youngest cohorts, and we cannot provide evidence of how the various processes influence the relationship between fertility and birth cohort, education and nationality.

Based on the above, it can be clearly stated that the high fertility of Roma reflects a compositional effect: the high fertility of the Roma population is certainly due to the fact that the proportion of low-educated Roma women in the Roma female population is much higher than the proportion of those with medium or high levels of education.

## 5.3. FERTILITY OF ROMA AND MAJORITY POPULATION BY RESIDENTIAL SEGREGATION IN HUNGARY

Our second interest in this paper is to capture the contextual effect on fertility behaviour among the Roma and majority populations of CEE countries using the Hungarian example: only in the case of Hungary do we have access to individual data of residential proximity. Furthermore, we can also take advantage of the ethnic identification used in the 2011 population census. As we mentioned earlier, a secondary ethnic identification was allowed in the Hungarian census, and so we could include among the population who identified as Roma also those with dual identity. This enlarged our working definition of Roma population[9] without influencing the fertility measures employed. (Note that the cohort fertility rate of primary-nationality Roma women and of those with Roma attachment does not differ either by birth cohort or by level of completed education – see Appendix 6.) The contextual effect – residential segregation – is measured in terms of the exposure of ethnic-minority members to the majority population in the same area (*interaction index*). The residential segregation of Roma women is measured at the level of the women's residential neighbourhood, and is calculated as the share of the Roma population within the total population of a residential neighbourhood.[10]

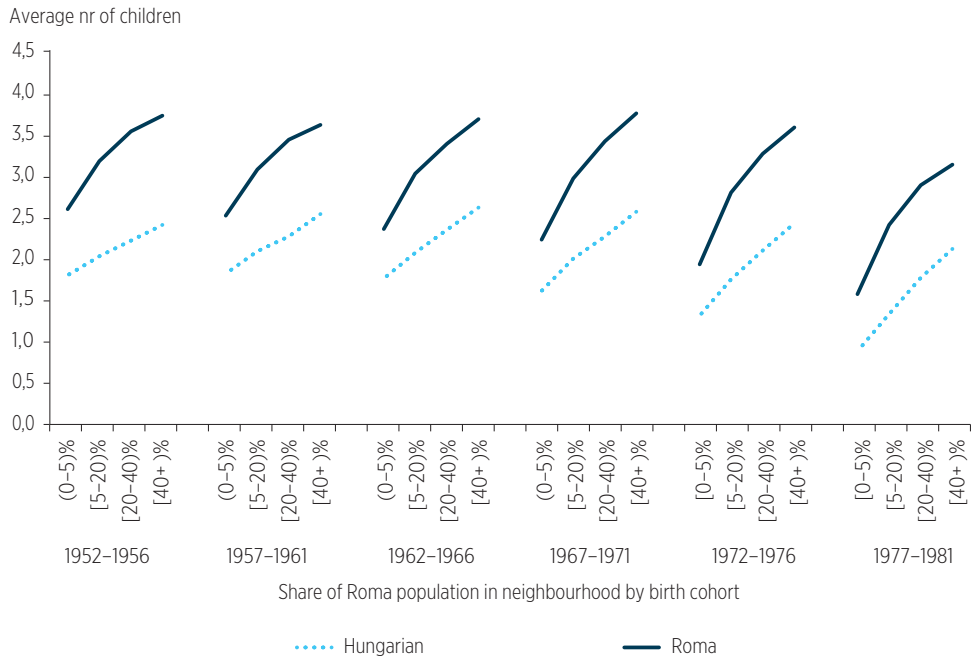
As Fig. 3 shows, the relationship between the level of cohort fertility and the degree of residential segregation is positive in all birth cohorts, and among both Hungarian and Roma women: the greater the share of Roma in the residential neighbourhood, the higher the average number of children ever born to both Roma and Hungarian women.

The cohort fertility differences between the most and the least segregated neighbourhoods are larger among Roma than among Hungarian women, regardless of birth cohort; while this difference ranges from 0.61 to 1.24 for different birth cohorts among Hungarians, the figure is between 1.10 and 1.66 among Roma birth cohorts.

It is clear from Fig. 3 that the cohort fertility of Roma women is higher than that of Hungarian women at all degrees of segregation. However, a clear convergence can be observed: the lower the level of segregation, the smaller the fertility gap between Roma and Hungarian women. While the fertility difference between Roma and Hungarians in the most segregated neighbourhoods ranges from 1.02 to 1.32 (depending on birth cohort), the difference is only between 0.60 and 0.80 in the least segregated.

9 In this and the next section we consider a woman to have Roma identity if her primary or secondary nationality is Roma, or if her mother tongue is Roma, or if she uses the Roma language when she speaks to friends and family members, or if she knows the Roma language (Appendices 2 and 3). We thereby increase the number of Roma women in the selected cohorts from 23,275 (only primary nationality) to 57,627 (identity connected in some way to Roma nationality).

10 In total, there were 183,398 residential neighbourhoods defined in the 2011 Population and Household Census data for Hungary. In our target group for analysis in this section, i.e. 30–59-year-old women living in a residential block with a minimum of 15 persons and at least one Roma inhabitant, the number of Roma women was 57,529; meanwhile, there were 877,637 women of Hungarian nationality (Roma not mentioned at all).




*Notes:* Hungarians are those who answered 'Hungarian' (but not Roma) to the questions on primary nationality, secondary nationality, mother tongue, language spoken with friends and family, and known language. Roma are those who answered 'Roma' (or beás, oláh cigány, or any other Roma clan name) to the questions on primary nationality, secondary nationality, mother tongue, language spoken with friends and family, and known language.
*Source:* Own calculation based on Population and housing census 2011, Hungary.

Figure 3

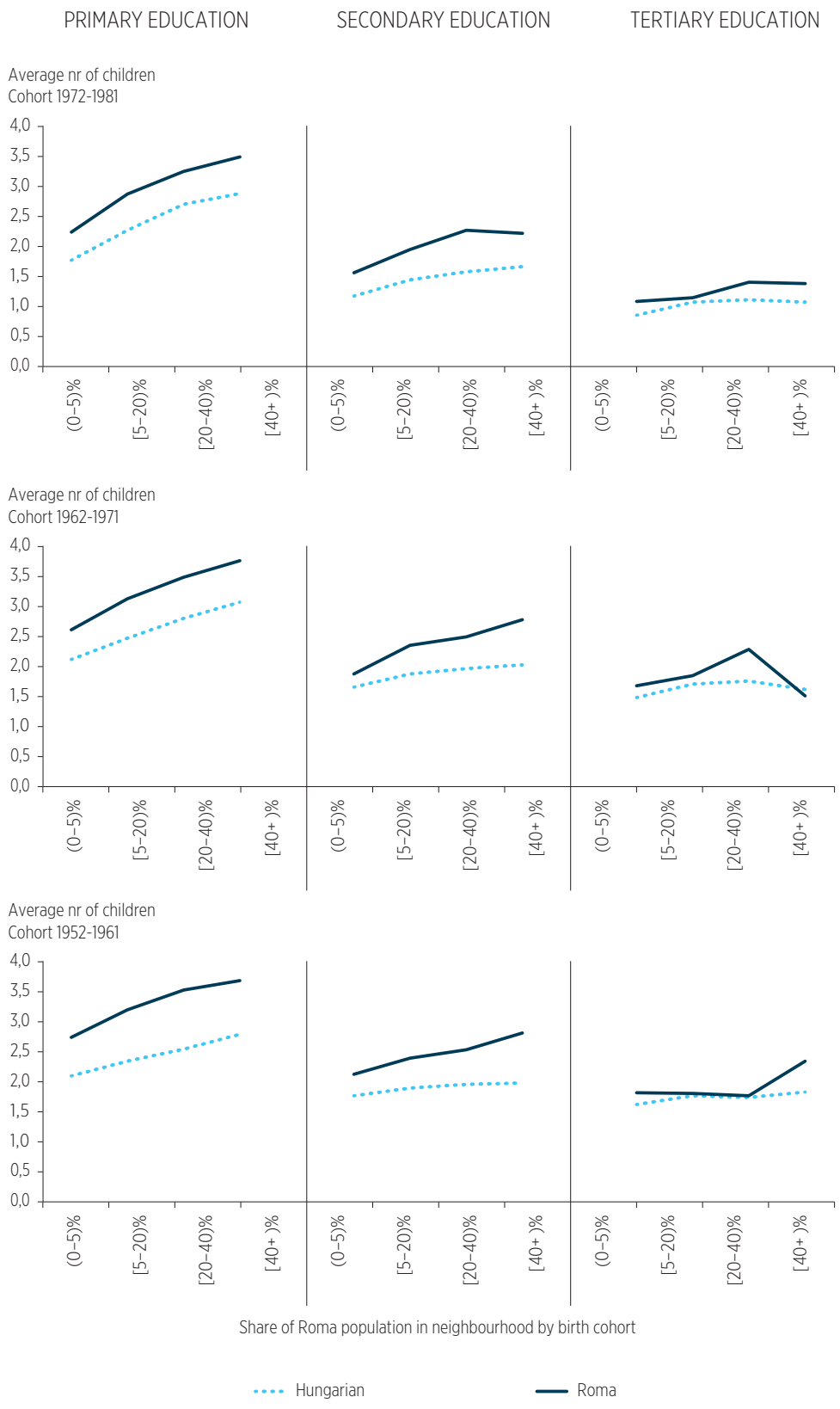
*Average number of children ever born, by women's nationality and degree of residential Roma segregation, Hungary, 2011*

## 5.4. JOINT EFFECTS OF COMPLETED EDUCATION AND DEGREE OF RESIDENTIAL SEGREGATION IN HUNGARY

The completed fertility of three different cohorts (1952–1961; 1962–1971; and 1972–1981) by completed education and degree of residential segregation enables us to disentangle possible reinforcing effects. The two ends of the educational spectrum show quite different relations (Fig. 4). On the one hand, higher education seems to determine the level of fertility quite unequivocally: the completed fertility of the majority population is similar to that of the Roma population, and degree of residential segregation does not add much to the variation.

Among highly educated women, the fertility difference between Roma and the majority population is relatively constant and small. Minor fluctuations can be observed among Roma women by degree of residential segregation due to the low number of highly educated Roma women living in segregated areas, especially among the oldest birth cohorts.[11] All in all, among women with a high level of education, ethnicity make no great difference.

11 The number of well-educated Roma women living in segregated areas was low in the oldest birth cohort (i.e. born in 1952–1961): just four in neighbourhoods where the share of the Roma population was 20–40%; and three in neighbourhoods where the share of Roma was over 40%. However, there were 22 well-educated Roma women from the youngest generation (born 1972–1981) living in the most-segregated neighbourhoods, with a share of Roma in excess of 40%.




*Note:* Hungarians are those who answered 'Hungarian' (but not Roma) to the questions on primary nationality, secondary nationality, mother tongue, language spoken with friends and family, and known language. Roma are those who answered 'Roma' (or beás, oláh cigány, or any other Roma clan name) to the questions on primary nationality, secondary nationality, mother tongue, language spoken with friends and family, and known language.
*Source:* Own calculation based on Population and housing census 2011, Hungary.

Figure 4

*Average number of children ever born by women's nationality, completed education and degree of residential Roma segregation, Hungary, 2011*

At the other end of the scale, among women who have only primary education, residential segregation clearly influences the level of fertility. The higher the proportion of Roma in a neighbourhood, the higher the fertility of women. And this relationship is the same for Roma and non-Roma women. However, ethnicity also makes a difference: the cohort fertility of low-educated Roma women is always higher than that of low-educated Hungarian women, regardless of the degree of residential segregation.

At a medium level of education, the relationship between residential segregation and cohort fertility differs between Roma and Hungarian women. We find a positive relationship among Roma women: fertility rises as the level of segregation increases. Meanwhile, barely any positive relationship is discernible among Hungarian women: fertility remains relatively constant as the degree of residential segregation increases. At this level of education, a divergence in cohort fertility can be noted between Roma and Hungarian women as residential segregation increases: this divergence is caused by an increase in the cohort fertility of Roma women. In other words, while level of education strongly determines the fertility of ethnic-majority women, the completed fertility of Roma women is powerfully related to residential segregation.

## 6. DISCUSSION AND CONCLUSION

As noted in the introduction, we have contributed to an understanding of the specific fertility behaviour of a quite sizeable minority population – the Roma. We have done this in a comparative manner, including in our analysis four of the five countries of Central and Eastern Europe with a large Roma population. We have shown that the fertility behaviour of Roma in all these countries is very similar in terms of both fertility level and cohort change. We have also shown comparatively that level of education has a robust impact on level of fertility among Roma. Lastly, we have demonstrated, using the case of Hungary, that exposure to ethnic-majority behaviour also has a big impact.

In each of the four countries investigated, the fertility level of ethnic Roma – as measured by the mean number of children – is far above the average for both the country and the majority population. At the same time, the distinct fertility pattern of Roma – early and high fertility – is similar, irrespective of the country in which they live.

We also outlined three major concepts employed in understanding ethnic-minority fertility. We are aware that our report is inadequate to test the different concepts, but it may contribute to the arguments for or against these concepts. The first concept – known as the *social characteristics* hypothesis – states that it is not ethnicity per se, but rather social characteristics that determine fertility behaviour. Our results clearly show that the level of completed education of women is related to fertility behaviour in all the countries examined: the difference in fertility between Roma and the respective ethnic-majority population narrows as level of education increases; and the fertility of highly educated Roma and non-Roma women is almost the same or is closely converging. This result seems to be in accordance with the social characteristics hypothesis, but not with the *minority group status* hypothesis.[12]

Using the Hungarian data, we were also able to differentiate between the fertility of the Roma and the non-Roma population according to degree of residential segregation; to this end we used an interaction index that captures exposure to the ethnic-majority population behaviour within a residential neighbourhood. We noted that this index may be a proxy for cultural factors (*Wilson* and *Kuha* 2018), although we cannot exclude the possibility that structural forces (namely regional economic deprivation) may also exert an influence. Our results indicate that the fertility of Roma women is higher than the fertility of ethnic-majority women, regardless of the degree of residential segregation. At the same time, there is a clear convergence between Roma and non-Roma fertility behaviour when residential segregation is low: the lower the degree of Roma residential segregation, the smaller the fertility gap between Roma and non-Roma in all birth cohorts in Hungary. We may conclude that the exposure of Roma women to the majority culture depresses their fertility.

Our joint analysis of level of education and residential segregation showed that the two factors may exert a different force at the two ends of society. At the higher end of society, neither segregation nor ethnicity matters. At the lower end of the social hierarchy, both exposure to majority behaviour and ethnicity matter. Among the vast majority of Roma women, fertility increases with greater segregation. In addition, ethnic-majority women with a very low level of education exhibit increasingly minority-like fertility behaviour. On the one hand, among the ethnic-majority population, the completion of secondary education renders women immune to exposure to ethnic-minority behaviour. On the other hand, having secondary education clearly depresses the fertility behaviour of the Roma population, but the influence of residential segregation remains. The fertility

12 It should be noted that across countries and cohorts, there are three cases where fertility among highly educated Roma women was lower than among their highly educated ethnic-majority counterparts: among women born in 1977–1981 in Hungary, and among women born in 1952–1956 and in 1972–1976 in Serbia.

level of Roma women with medium (i.e. secondary) education increases with residential segregation, while the fertility level of ethnic-majority Hungarians with a similar level of education remains unaffected.

As far as the *cultural* approach goes, our very general findings – namely, the very similar patterns of fertility within the Roma population of different countries, controlled for education and cohort – may also be seen as an indicator of the cultural conditions related to the behaviour of Roma and their pronatalist attitude. All in all, several results tend to reinforce the importance of cultural factors.

Of course, our analysis and interpretations have several limitations. First of all, identification of the Roma population is not unequivocal and we have non-negligible missing values in the samples analysed; both these factors could have consequences for our results. Secondly, we should be very careful about interpreting our cross-sectional association. The well-known endogeneity problem, especially in the case of education and fertility, may weaken the relevance of the social characteristics concept. Thirdly, it may be oversimplistic to interpret segregation as a cultural factor: the fact that residential segregation is closely related to economic deprivation hints at the role of structural factors. Lastly, the non-inclusion of the time dimension in the analysis – i.e. how long people have lived in a particular place – may also influence the role of structural and cultural factors. The inclusion of additional contextual and individual factors would certainly lead to more detailed results. It falls to further research to overcome the limitations mentioned and to arrive at a more refined description of Roma fertility behaviour.

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# APPENDICES

Appendix 1

*Classification of countries and minorities – numeric and demographic characteristics of selected nationalities*

| Majority/minority population | Population size (total, in thousands) | Population size of women (total of 30–59-year-old women) | Distribution of women by level of education (% of low, medium, highly educated among women aged 30–59) | Total non-responses to question on number of children among women aged 30–59 |
|---|---|---|---|---|
| *HUNGARY* | | | | |
| Hungarian majority | 8,227 | 1,815,607 | 19 – 56 – 25 | |
| Roma primary nationality | 130 | 23,275 | 86 – 13 – 1 | |
| Roma attached | 327 | 57,627 | 82 – 14 – 4 | |
| *Non-response on nationality question* | *1,467* | | | |
| *ROMANIA* | | | | |
| Romanian majority | 16,792 | 3,683,220 | 29 – 51 – 20 | |
| Roma | 621 | 102,767 | 90 – 9 – 1 | |
| *Non-response on nationality question* | *1,237* | | | |
| *SLOVAKIA* | | | | |
| Slovak majority | 4,352 | 975,709 | 8 – 65 – 21 – (6) | 62,217 |
| Roma | 105 | 15,866 | 66 – 15 – 1 – (18) | 3,035 |
| *Non-response on nationality question* | *382* | | | |
| *SERBIA* | | | | |
| Serb majority | 5,988 | 1,292,021 | 22 – 55 – 22 | |
| Roma | 147 | 25,658 | 92 – 7 – 0.5 | |
| *Non-response on nationality question* | *252* | | | |

*Note:* Hungary: we present in this table the data only for the primary nationality and for those Roma attached who answered 'Roma' (or beás, oláh cigány, etc. or any other Roma clan name) to the questions on primary nationality, secondary nationality, mother tongue, language spoken with friends and family, and known language. Romania: the distribution of completed education by nationality is extracted from IPUMS 10%, size of Romanian and Roma nationalities: N=366,776 and N=10,186. Slovakia: we present the distribution of completed education by nationality, plus the share of non-respondents in brackets.

*Source:* Own calculation based on Population censuses from Hungary, Romania, Slovakia and Serbia, 2011.

## Appendix 2

*The nationality question in the 2011 national censuses in Hungary, Slovakia, Romania and Serbia*

| Country | Type of question | No. of questions | Question(s) | Answer categories |
|---|---|---|---|---|
| Hungary | Not compulsory | 2 | *Which nationality do you feel you belong to?*<br><br>*Do you think you belong to another nationality in addition to what you marked above?* | Closed answer with 18 nationalities, the category Gipsy/ Roma among them, and the open-ended 'other, namely: ...' category offered. |
| Slovakia | Compul-sory | 1 | *Nationality* | Closed answer with 14 nationalities, the category Romani among them, and the open-ended 'other' category offered. |
| Romania | Not compulsory | 1 | *What ethnic group does the person consider he/she belongs to?* | Open-ended question, the enumerators coded them into categories. |
| Serbia | Not compulsory | 1 | *National affiliation* | Open-ended question, the enumerators coded them into categories. |

*Source:* Own design.

## Appendix 3

*The mother tongue, language spoken among family and friends and foreign language knowledge questions in the 2011 national census in Hungary*

| Question | Type of question | Answer possibilities | Question(s) | Answer categories |
|---|---|---|---|---|
| Mother tongue | Not compulsory | 2 | *What is your mother tongue? (Please mark two answers maximum!)* | Closed answer with 18 languages, the closed category Gipsy (Romani, Beas) among them, and the open-ended 'other, namely:' category offered. |
| Language spoken in family, with friends | Not compulsory | 2 | *What languages do you usually speak with family members or friends? (Please mark two answers maximum!)* | Closed answer with 18 languages, the closed category Gipsy (Romani, Beas) among them, and the open-ended 'other, namely:' category offered. |
| Known language | Compulsory | 3 | *What languages do you speak? In what languages can you understand others and make yourself understood?* | Semi-open-ended question: the category 'Hungarian' offered closed and three open-ended possibilities left to be filled. |

*Source:* Own design.

## Appendix 4

*The average number of children ever born, by women's birth cohort, selected countries, 2011*

| Birth cohort | HUNGARY | ROMANIA | SLOVAKIA | SERBIA |
|---|---|---|---|---|
| 1952–1956 | 1.91 | 1.99 | 2.29 | 1.83 |
| 1957–1961 | 1.95 | 1.97 | 2.24 | 1.83 |
| 1962–1966 | 1.93 | 1.86 | 2.14 | 1.80 |
| 1967–1971 | 1.82 | 1.61 | 2.02 | 1.74 |
| 1972–1976 | 1.55 | 1.54 | 1.76 | 1.60 |
| 1977–1981 | 1.09 | 1.28 | 1.30 | 1.26 |

*Source:* Own calculation based on Population censuses 2011 from Hungary, Romania, Slovakia and Serbia.

## Appendix 5

*The share of non-respondents to the question on the number of children, within different groups of women, by completed education and age group, Slovakia*

| Nationality, Age group | Primary or below | Secondary vocational | Secondary, high school/ grammar school | Higher education |
|---|---|---|---|---|
| *Slovak* | | | | |
| 30–34 | 6 | 5 | 6 | 6 |
| 35–39 | 4 | 3 | 4 | 5 |
| 40–44 | 7 | 5 | 4 | 5 |
| 45–49 | 7 | 5 | 4 | 5 |
| 50–54 | 6 | 6 | 4 | 6 |
| 55–59 | 6 | 7 | 4 | 7 |
| *Roma* | | | | |
| 30–34 | 8 | 9 | 22 | 24 |
| 35–39 | 5 | 8 | 11 | 44 |
| 40–44 | 12 | 14 | 42 | 43 |
| 45–49 | 13 | 18 | 44 | 52 |
| 50–54 | 14 | 25 | 36 | 36 |
| 55–59 | 13 | 32 | 19 | 38 |

*Source:* Own calculation based on Population and housing census 2011, Slovakia.

## Appendix 6

*Average number of ever born children by women's birth cohort, primary-nationality Roma women and women with Roma attachment, Hungary 2011*

| Birth cohort: | Education | Roma primary nationality | Roma attached | Birth cohort: | Education | Roma primary nationality | Roma attached |
|---|---|---|---|---|---|---|---|
| 1977–1981 | High | 0.68 | 0.85 | 1962–1966 | High | 1.90 | 1.84 |
| | Medium | 1.81 | 1.75 | | Medium | 2.32 | 2.24 |
| | Low | 3.04 | 2.94 | | Low | 3.46 | 3.37 |
| 1972–1976 | High | 1.37 | 1.34 | 1957–1961 | High | 1.86 | 1.78 |
| | Medium | 2.08 | 2.08 | | Medium | 2.29 | 2.36 |
| | Low | 3.37 | 3.28 | | Low | 3.40 | 3.33 |
| 1967–1971 | High | 1.65 | 1.65 | 1952–1956 | High | 1.78 | 1.84 |
| | Medium | 2.22 | 2.23 | | Medium | 2.21 | 2.23 |
| | Low | 3.49 | 3.40 | | Low | 3.43 | 3.40 |

*Notes:* Roma attached are those who answered 'Roma' (or beás, oláh cigány, or any other Roma clan name) to the questions on primary nationality, secondary nationality, mother tongue, language spoken with friends and family, and known language.
*Source:* Own calculation based on Population and housing census 2011, Hungary.

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## NOTES

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