Census-Linked Study on Ethnic Fertility Differentials in Lithuania

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Abstract

Fertility transformations observed since the early 1990s and their determinants have been rather thoroughly investigated in Lithuania. There are fairly numerous national and international studies devoted to this topic, mainly based on survey data. However, none of these studies look into the effect of ethnicity on fertility. It is, to a large extent, caused by limitations of the sample survey data. This study demonstrates the potentials of census-linked fertility data to estimate robust and nationally representative parity-specific period fertility measures by ethnicity. The findings of this first systematic study of ethnicity-specific fertility differentials in Lithuania indicate that ethnicity does matter for fertility even in such an ethnically homogenous country as Lithuania. Fertility among Lithuanians is higher than in the other ethnic groups, especially among Russians. Lower fertility in the Russian ethnic group is mainly explained by differences in the risk and timing of having the second child. Importantly, this disadvantage remains significant even after controlling for selected compositional characteristics including urban-rural place of residence and education. The approach used in this study may be applied for Latvia and Estonia, where national minorities constitute substantial shares of the entire population and significantly contribute to overall fertility levels.

Keywords: ethnic differences, fertility, birth order, census-linked, Lithuania.

Introduction

In the beginning of the 1990s, significant transformations in the patterns of fertility behaviour started in Lithuania, with a rapid fertility decrease and postponement of births until later ages being among the most pronounced features of this process. The total fertility rate, which for about twenty years stood close to the replacement level, decreased to unprecedented lows - the TFR fell to as low as 1.23 in 2002. Soon after, however, the trend reversed and fertility started increasing. According to statistical data, the TFR was 1.6 in 2012. The mean age at first birth has been continuously increasing since the mid-1990s: it increased from 23.04 to 26.63 between 1994 and 2012 (Statistics Lithuania, 2013; Human Fertility Database, 2014).

There are a number of national and international comparative studies devoted to examining fertility changes and their causes in Lithuania. They have found that determinants of the observed fertility changes in Lithuania are diverse and associated with demographic, social, economic, and cultural transformations experienced by a post-Soviet society. In particular, previous research points to the importance of economic factors, which played a crucial role in fertility changes in Lithuania at the beginning of the transformation period as well as during the economic crises of the 1990s and of 2008-2009 (Stankuniene, 1999, 2009). Economic hardships and labour market uncertainties brought by the economic recessions of the 1990s and of 2008-2009 pushed some segments of the population (as far as their income, housing, and upbringing of children are concerned) to the periphery of economic welfare. A great gap between the needs and the chances to satisfy those needs forced

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significant numbers of people to change or postpone their childbearing intentions (Stankuniene & Jasilioniene, 2008). At the same time, the state family policy, which could become an important factor for positive changes in fertility by providing families with needed assistance, suffered from inconsistency, fragmentation, and short-sighted priorities inadequate to the situation (Stankuniene, 2010). Although economic factors remain very important, they are only complementary factors that augment the transformation of family and predetermine a very low fertility level. More important are cultural factors, including the increasing individualisation of the society, emancipation, liberalising attitudes and standards of behaviour, as well as access to modern contraceptive technologies, i.e. the factors that have been identified in the theory of the Second Demographic Transition as the key factors predetermining family changes and fertility decline in post-modern societies (van de Kaa, 1987, 1997; Lesthaeghe, 1995; Surkyn & Lesthaeghe, 2004). Four decades ago these factors gave rise to family transformation in the Western countries, and in the last decade of the 20th century they became visible in the countries of Central and Eastern Europe, including Lithuania.

Most of the existing analysis on the underlying fertility determinants has been performed on the basis of survey data: the Family and Fertility Survey (conducted in Lithuania in 1994-1995), the Population Policy Acceptance Survey (conducted in 2001), most recently the Generations and Gender Surveys (conducted in 2006 and 2009), and other smaller scale surveys (Stankuniene, Baublyte, Kanopiene, & Mikulioniene, 2000; Stankuniene et al., 2003; Stankuniene & Maslauskaite, 2009; Stankuniene, Maslauskaite, & Baublyte, 2013). However, none of the publications and reports based on data from these sample surveys specifically look into the effect of ethnicity on fertility. At the same time, evidence from neighbouring Latvia and Estonia suggests that ethnicity is an important determinant of fertility (Zvidrins, 1998; Puur, Põldmaa, & Sakkeus, 2009; Abuladze, Rijken, Rahnu, & van Wissen, 2013). Although national minorities constitute a smaller share in Lithuania than in Estonia and Latvia, the assessment of the magnitude of fertility differentials is important in order to develop more equitable family policy measures and to achieve more sustainable fertility changes at the country level in the future. This study aims to fill in the existing research gap by using high quality census-linked fertility data covering the entire population of Lithuania. The data used for this study allows to produce parity-specific estimates of fertility level and mean age at birth for four major ethnic groups in Lithuania: Lithuanians, Poles, Russians, and other. The study also examines whether identified ethnical variation in fertility can be explained by differences in important compositional characteristics such as education, economic activity status, and urban-rural place of residence.

Background

The main obstacle to studying ethnic fertility differentials in Lithuania and in other countries is the availability and limited scope of relevant data. Furthermore, often studies are hardly comparable due to differences in the definition of ethnicity (Simon, 2007; Dubuc & Haskey, 2010). For example, some authors suggest that ethnicity is a social construct based on a type of collective sense of identity and functions beyond the limits of related attributes such as territory, citizenship, language or religion (Simon, 2007, p. 27). A large variety of data sources and definitions have been used in the studies on the demographic behaviour of ethnic groups. One of the most widely used sources of information on ethnicity is self-reported information about ethnicity from censuses or surveys. Both self-reported information about ethnicity and proxy variables such as place of birth (foreign- or native-born) or citizenship are usually used for studying ethnic differentials. Many countries and international agencies treat information about ethnicity as sensitive data that may potentially be used for discrimination or stigmatisation purposes. Even the UN recommendations for censuses in the European region suggest the ethnicity variable as optional only (a non-core topic) (United Nations Economic Commission for

Europe, 2006). Due to long-standing traditions of registration of ethnicity, the majority of former communist countries of Central and Eastern Europe (including Lithuania) still continue including the ethnicity question in population censuses and surveys (Simon, 2007).

Country-specific studies show notable differences in the definition of ethnic groups used in surveys of demographic (including fertility) behaviour. Most European countries use the definition of ethnicity based on country of origin or citizenship (Toulemon, 2004; Sobotka, 2008; Dubuc & Haskey, 2010; Coleman & Dubuc, 2010; Waller, Berrington, & James, 2012). In the Central and Eastern European region, for instance, several studies devoted to examining and comparing the fertility of native-born and foreign-born population groups have been conducted in Estonia (Katus, Puur, & Põldma, 2002; Katus, Puur, & Sakkeus, 2002; Katus & Puur, 2006; Puur et al., 2009; Abuladze et al., 2013). Importantly, Estonian studies based on the life course approach cover both first and second generation immigrants (Abuladze et al., 2013). Studies on fertility differences by ethnicity using self-reported information from censuses or surveys are less common. They usually focus on fertility behaviour and its determinants among distinctive ethnic minorities such as Turks in Germany and Bulgaria (Koytcheva, 2006; Koytcheva & Philipov, 2008; Wolf, 2014). In the USA, numerous studies using self-reported information about ethnicity and race have been conducted in order to explore the phenomenon of high fertility among Hispanic white Americans (Forste & Tienda, 1996).

Although fertility by ethnic group in Lithuania has never been thoroughly examined, some relevant (although fragmentary) data were produced in the period of the soviet rule. A large-scale study conducted in the early 1970s showed that Lithuanians had higher fertility compared to Russians and the other ethnic group, consisting of Ukrainians and Belarusians (Bondarskaya, 1977). However, the same study based on self-reported information suggested that these differences could be explained by a larger share of Lithuanians residing in rural areas. Within the urban subpopulation, the ethnicity-specific fertility estimates were rather similar across different ethnicities (Bondarskaya, 1977). A more recent comparative study, analysing fertility intentions based on the GGS survey data for 2006, did not find any statistically significant ethnic differences in Lithuania (Charton, Surkov, Stankuniene, & Baublyte, 2009). Interestingly, these findings contradict those observed in Estonia, which showed systematic differences both in fertility and fertility intentions between the population of foreign origin and native Estonians (Puur et al., 2009; Abuladze et al., 2013). The scarcity of evidence on ethnic differentials in fertility in Lithuania is, to a large extent, caused by limitations of sample survey data. Lithuanians constitute more than 80 per cent of the total population and the shares of other ethnicities are relatively small. In some situations, this is an important obstacle for obtaining statistically robust demographic indicators by ethnic group. Due to differences in definitions, study designs, and methods, evidence about the underlying determinants explaining ethnic fertility differentials is even more scarce and contradictory. Forste and Tienda (1996) suggest three mainstream explanations for the differentials. First, the social characteristics hypothesis attributes the observed fertility differentials to differences in population composition by socio-demographic or socio-economic status (especially education and income). Second, the 'minority status' hypothesis suggests that women belonging to an ethnic minority group limit family size in order to have better chances for upward social mobility (Forste & Tienda, 1996). Third, the cultural hypothesis, on the contrary, attributes differential fertility to inequities in pronatalist values and subcultures that support large families (Forste & Tienda, 1996). Several hypotheses have been developed in order to explain specific fertility patterns of ethnic minority migrants in relation to fertility in their native countries (Kulu, 2005). One of the important factors of fertility is socialisation related to the adaptation of values and norms at early life stages in the country of origin and their persistence at adult (childbearing) ages in the country of immigration (Kulu & Milewski, 2007). At the same time, the disruption hypothesis suggests that economic and psychological costs related to moving to another country cause at least a temporal decrease in fertility (Goldstein, 1973; Kulu, 2005; Persson & Hoem, 2014). The adaptation hypothesis, based on differences in the cost-benefit of children in the native and immigration countries, claims that the fertility of

ethnic minorities always tends to converge towards the level of the immigration country (Milewski, 2007). Finally, migrants can be treated as a selective group in terms of many characteristics such as health, values, and motives for migration (including family formation) (Kulu, 2005; Milewski, 2007). However, the conflicting evidence from different studies and countries suggests that there is no universal explanation for the fertility behaviour of ethnic groups or migrants.

Data and methods

This study is part of the scientific project that aims at creating and analysing a multidimensional frequency dataset constructed by linking records from the 2001 Population and Housing Census of Lithuania with birth, death, and emigration records from the Population Register of Lithuania. The unique dataset obtained in the framework of this project is among the first ones of this type in the region of Central and Eastern Europe.

The dataset contains all records from the 2001 census linked with all birth, death, and emigration records from the population register for the period between April 6, 2001, when the census was conducted, and December 31, 2002. Death and emigration records are needed in order to calculate precise numbers of person-years lived by each individual during the period of observation. The linkage of records was implemented by employees of Statistics Lithuania, who have permission to work with individual level data. The census-linked dataset was implemented in two steps. In the first step, individual census and vital records were linked by means of personal identification numbers, used as unique identifiers for the same individuals. In the next step, individual level data was transformed into aggregated multidimensional frequency format, providing aggregated births and person-years for every possible combination of categories of the available variables.

The set of socio-demographic variables used for the present study includes ethnicity, mother's date of birth, birth order, marital status, education, on-going education/studying, economic activity status, and urban-rural residence. Information on ethnicity was taken from the census. Ethnicity is self-determined and the census provides the following categories of ethnicity: Lithuanian, Russian, Polish, and other. Birth order refers to the biological (true) birth order: the birth order ranks the child in relation to all of the previous live-born children of the mother. In the case of multiple deliveries, each child is counted separately depending on the sequence of birth.

The data used to calculate conventional period fertility indicators, such as the total fertility rate (TFR) and the mean age at birth (MAB), as well as to estimate the impact of ethnicity on fertility, cover all females between the exact ages of 12 and 49 and include over 1.67 million person-years of population exposure and about 51.3 thousand births. Person-years and birth counts by ethnicity are provided in Table 1, including births split by birth order. Following a general algorithm, ethnicity-specific total fertility rates were estimated by summing up age-specific fertility rates for each ethnic group. These age and parity specific rates were calculated by dividing and parity-specific birth counts in a given age category by the corresponding number of person-years of exposure estimated for all females (all birth orders combined) in the same age category.

The impact of ethnicity on fertility was estimated by applying the Poisson regression for count data with births as the dependent variable. Statistical modelling produced by the Poisson regression is the most commonly used modelling approach for such frequency data, including count data. Results obtained from the Poisson regressions are presented in the form of relative fertility rate ratios together with their 95 per cent confidence intervals. The regression analysis was performed for the second birth order births showing the most pronounced differences. For this regression, a respective subsample of females with one child was formed. Confounding effects on the ethnicity-specific regression coefficient were assessed using models controlling for age only (Model 1), additional socio-demographic variables (Models 2-6), and all variables (Model 7).

Table 1: Population exposure and births by ethnicity, Lithuanian females aged 12-49, 2001-2002

	Lithuanian	Russian	Polish	Other	Total
Person-years	1,405,629 (84.0%)	104,205 (6.2%)	114,970 (6.9%)	48,244 (2.9%)	1,673,048 (100%)
All births	44,102 (86.0%)	2,530 (4.9%)	3,464 (6.8%)	1,173 (2.3%)	51,269 (100%)
1st births	20,773 (85.6%)	1,288 (5.3%)	1,661 (6.8%)	547 (2.3%)	24,269 (100%)
2nd births	14,898 (86.2%)	788 (4.6%)	1,225 (7.1%)	379 (2.2%)	17,290 (100%)
3rd+ births	8,431 (86.8%)	454 (4.7%)	578 (6.0%)	247 (2.5%)	9,710 (100%)

Source: calculated by the authors according to aggregated census-linked data by Statistics Lithuania

Results

Table 2 shows ethnicity and birth order-specific total fertility rates for Lithuania in 2001-2002. The results indicate that the Lithuanian and Polish ethnic groups have the highest TFR – 1.23 and 1.22 respectively, whereas the lowest TFR of 1.07 was found for the population of Russian ethnicity. Further analysis of fertility by birth order reveals that the significant differences found between the overall TFR of Russians and Lithuanians are mainly attributable to differences in the TFR for birth order 2 and 3+; the TFR for birth order 1 is fairly similar in the two population groups.

Figure 1 provides some insights about ethnicity-specific differences in both the levels and timing (age pattern) of fertility. The differences are mostly pronounced within the age interval of 22-32 years. At first glance, Polish females have a notable advantage in fertility rates against the other ethnic groups, but only between the ages of 20 and 25. After the age of 25, Polish fertility rates very rapidly decrease and this group becomes the group with the lowest fertility. A similar and even more rapid decline in fertility rates after the age of 25 can be observed also for females from the ethnic group 'others'. Despite some disadvantage observed between the ages of 22 and 24, Lithuanian females catch up and surpass Polish females, especially after the age of 28. Despite some similarities in the shape of age-specific fertility curves for Lithuanian and Russian females, Russian females systematically demonstrate substantially lower (even the lowest) fertility rates between the exact ages of 20 and 30 (Figure 1). Figure 2 further discloses differences in age-specific fertility patterns by birth order. For the first births, we found a remarkable similarity between Lithuanian and Russian females in both the

Table 2: Ethnicity and order-specific total fertility rates (TFR). Lithuania, 2001-2002

Ethnicity	TFR	TFR1	TFR2	TFR3+
Lithuanian	1.23	0.59	0.42	0.23
Russian	1.07	0.56	0.33	0.18
Polish	1.22	0.61	0.43	0.19
Other	1.13	0.55	0.37	0.22
Total	1.22	0.59	0.41	0.22

Source: calculated by the authors according to aggregated census-linked data by Statistics Lithuania
Note: Due to rounding, the sum of order-specific TFRs does not always equal the overall TFR

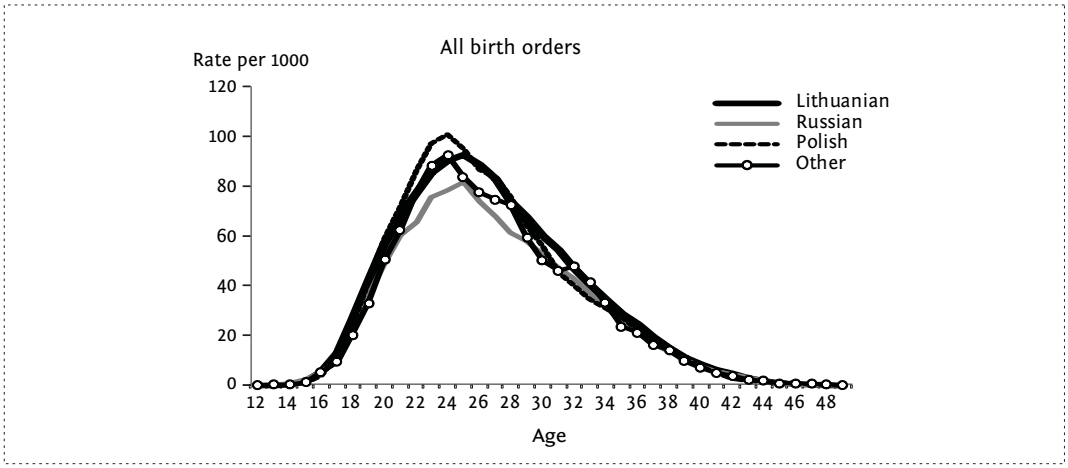

Figure 1: Ethnicity and age-specific fertility rates for all birth orders combined. Lithuania, 2001-2002
Source: calculated by the authors according to aggregated census-linked data by Statistics Lithuania

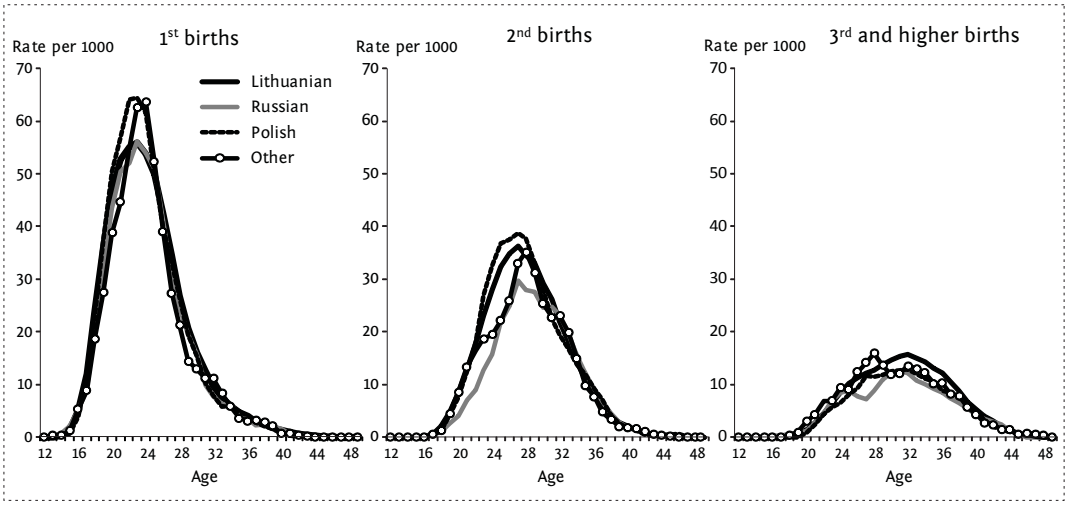

Figure 2: Ethnicity and age-specific fertility rates for the first, second, and third and higher births orders. Lithuania, 2001-2002
Source: calculated by the authors according to aggregated census-linked data by Statistics Lithuania

timing and levels of fertility rates. As for all births combined, Polish females show a distinctive pattern with highest fertility rates for first births between the exact ages of 20 and 25. A similar advantage can be also observed for 'other' females, who show a huge fertility peak at the ages of 23 and 24. The lowest fertility rates for second births concern Russian females, who show a striking disadvantage against other ethnic groups (with the exception of 'other' females aged 24-26) before the age of 30. The highest fertility for this birth order is observed for Polish (before the age of 28) and Lithuanian females. Finally, the age-specific pattern for the 3rd and higher order births disclose an advantage of Lithuanian and 'other' females, whereas Russian females again show the lowest rates, especially at the ages where the most of these births occur (Figure 2).

Table 3: Ethnicity and order-specific mean ages at birth. Lithuania, 2001-2002

Ethnicity	MAB	MAB1	MAB2	MAB3+
Lithuanian	27.34	24.72	28.52	31.96
Russian	27.37	24.67	29.54	31.67
Polish	27.00	24.46	28.43	31.95
Other	27.30	24.75	28.75	31.27
Total	27.31	24.70	28.56	31.92

Source: calculated by the authors according to aggregated census-linked data by Statistics Lithuania.

Table 4: Poisson regression fertility rate ratios for the second births by ethnicity. Lithuania, 2001-2002[1]

Ethnicity	Model 1 Age only	Model 2 Age+Mar.	Model 3 Age+Educ.	Model 4 Age+Stud.	Model 5 Age+Econ.	Model 6 Age+Resid.	Model 7 All var.
Lithuanian	1	1	1	1	1	1	1
Russian	**0.64*** 0.60-0.69	**0.66*** 0.61-0.71	**0.65*** 0.61-0.70	**0.64*** 0.60-0.69	**0.65*** 0.60-0.70	**0.69*** 0.64-0.74	**0.72*** 0.67-0.77
Polish	**0.90*** 0.85-0.96	**0.90*** 0.84-0.95	**0.92*** 0.87-0.98	**0.89*** 0.84-0.95	**0.91*** 0.86-0.97	**0.87*** 0.82-0.93	**0.88*** 0.83-0.93
Other	**0.77*** 0.69-0.85	**0.78*** 0.70-0.87	**0.78*** 0.70-0.86	**0.77*** 0.69-0.85	**0.77*** 0.70-0.86	**0.80*** 0.72-0.89	**0.83*** 0.74-0.92

* second birth rate ratios are statistically significant ($p<0.05$)
Source: calculated by the authors according to aggregated census-linked data by Statistics Lithuania

Ethnicity-specific estimates of the mean age at birth by birth order, presented in Table 3, demonstrate that the overall mean age at birth is rather similar across the ethnic groups of Lithuania. The same conclusion can be made about the mean age at first as well as at third and higher order birth. More pronounced ethnic differences are found in the mean age at second birth, with Russians being most diverged from the other ethnicities. Russian mothers give birth to their second child on average about one year later than mothers of Lithuanian, Polish, or 'other' ethnicities.

Ethnic groups in Lithuania are quite unevenly distributed by educational level and place of residence (e.g., the majority of the Russian population resides in urban areas). In order to check whether compositional differences can explain the discovered differences in the risk of second births, models controlling for additional variables were tested. The findings suggest that although some effects of compositional differences by education, urban-rural residence, marital status, and economic activity status are evident, they do not change the direction of the observed ethnicity gradient of second births (Table 4). Out of the five control variables, the urban-rural place of residence variable has the most significant effect. After controlling for all variables under study (Model 7), a lower risk of second births in other than Lithuanian ethnic groups (especially among Russian females) remains pronounced.

1 Lithuanian ethnicity is used as the reference group. Model 1 – controlled for age only; Model 2 –controlled for age and marital status; Model 3 – controlled for age and education; Model 4 – controlled for age and studying; Model 5 – controlled for age and economic activity status; Model 6 – controlled for age and place of residence; Model 7 – controlled for all variables: age, marital status, education/studying, economic activity, and place of residence.

Discussion and conclusion

This study demonstrates the potentials of census-linked fertility data for estimating robust and nationally representative parity-specific period fertility measures by ethnicity, even for such a small and ethnically homogenous country as Lithuania. Using survey data, obtaining reliable and statistically significant estimates of this kind is virtually impossible. The approach used in this study may be applied also for Latvia and Estonia, where national minorities constitute substantial shares of their populations. Understanding the scale and determinants of the lower fertility of specific ethnic groups is important because population groups with lower fertility eventually depress the overall fertility level of a country.

The findings of this first systematic study of ethnicity-specific fertility differentials in Lithuania indicate that ethnicity does matter for fertility even in a small and ethnically homogenous country. Fertility among Lithuanians is higher than in the other ethnic groups, especially among Russians. The lower fertility in the Russian ethnic group is mainly explained by differences in the risk of having a second child. Importantly, this disadvantage remains significant even after controlling for selected compositional characteristics, including urban-rural place of residence and education. This finding implies that the observed differences cannot be fully explained by the 'social characteristics' hypothesis, suggesting the decisive role of compositional differences for ethnicity-specific differentials such as possible disadvantages in education or income. It is important to note that our study covers the period of recovery from the economic crisis, which followed the dramatic socio-economic and political transformations of the early and mid-1990s. If the other ethnic groups suffered more from economic problems than the Lithuanian group, we could expect to observe more pronounced differences, especially in the mean ages at birth (which may be influenced by postponement of births until later ages). Some postponement effect can be observed for the second and higher order births and mostly concerns Russian females. The modelling results and existing evidence suggesting that income in Lithuania (in general) is closely related to the level of education also do not support the 'minority status' hypothesis. Since our findings indicate rather modest differences in the levels of fertility (as reflected by total fertility rates), we may speculate that this is some evidence supporting the 'adaptation hypothesis' and a further convergence of fertility levels may be expected in the future. The main obstacle for such convergence is the postponement of second and higher order births among Russian and Other females.

The results on Lithuania are similar to those on ethnic fertility differentials in Estonia and Latvia, suggesting that fertility behaviour of ethnic minorities in the three Baltic countries is somehow different from that of their ethnic majorities – Estonians, Latvians, and Lithuanians. In Latvia and Estonia, ethnicities originating from the Slavic countries of the former Soviet Union are found to exhibit younger childbearing age, lower level of childlessness and lower progression to second and subsequent births as compared to Estonians and Latvians, respectively (Zvidrins, 1998; Katus, Puur, & Sakkeus, 2002; Sakkeus, 2000; Puur, Põldma, & Sakkeus, 2009). Additionally, fertility patterns of Russian speaking minorities seem to be similar to those observed in their home regions (Barkalov, Dörbritz, & Kirmeyer, 1999; Katus, Puur, & Sakkeus, 2002).

This study provides new evidence to the scarce existing literature on fertility patterns of distinct ethnic groups in Lithuania and the Baltic region. At the same time, it stimulates further investigation of the factors responsible for the identified ethnicity differentials. The observed differences in fertility behaviour should be taken into account in formulating more equitable family policies in Lithuania.

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