Education and Fertility: Do Educated Parents Have Fewer Children?

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Abstract

In this piece, the author examines the problem of education vs. fertility. The main objective is to re-assess the relationship between the two. In the prevailing view in demographic literature, education is treated as a highly influential factor in reproductive behaviour. This view posits a simple linear relationship between education and fertility and hence assigns to both a rather mechanical interdependency. To surpass such speculations, a multi-disciplinary approach is called for. It is argued that education and fertility make, rather than a simply linear relationship, a subtle pair with many markedly intertwined dependencies. Analysed are selected heterogeneous geographical regions of Slovenia and their population structure as well as selected population groups throughout Slovenia. The analyses bring to the fore evidence in support of the thesis on a curved relationship between education and fertility. It is concluded that disparities in fertility rates among women with dissimilar levels of education in the studied territories were slowly diminishing through time, or have converted into other kinds of factor relations.

KEYWORDS: education, fertility, factors of fertility, Slovenia

Introduction

In demographic literature, education is treated as one of the decisive factors of fertility behaviour. These are usually divided into two categories: the proximate factors or direct causes of fertility, and the intermediate or indirect factors. The proximate fertility factors such as conception exposure etc. were initially given more attention and were thoroughly dealt with and classified half a century ago (cf. e.g. Davis and Blake 1956). At that time, the indirect factors were not considered as a rule; their importance was recognised only later. Increased knowledge of indirect factors brought forth several classifications, making the social factors' subgroup one of the most prominent. Classified as one of the social factors of fertility behaviour, education received much attention among researchers, particularly because historically the emergence of compulsive mass education in 'economically developed' countries coincides with a watershed decrease in fertility rates (cf. Caldwell 1980; Van De Kaa 1987; Jejeebhoy 1995; Mare and Maralani 2006). In Slovenia, authors generally disregarded the social factors of fertility behaviour until a few decades ago. The

ANTHROPOLOGICAL NOTEBOOKS 13 (2): 35–50.
ISSN 1408-032X

majority of authors in demographic studies in Slovenia see education as one among several social factors of fertility behaviour (e.g. Malačič 1985: 112-116; Ščircelj 1991: 112-118; Černič Istenič 1994: 36-37; Kožuh Novak et al. 1998: 45). By and large, it was thought that the higher the people's level of education, the lower their fertility rates. By way of generalisation, this notion extended to mean that the higher the education levels in the general population, the lower the average fertility rates drop: in this way, education is no longer seen as one of the factors in fertility behaviour, but as the direct cause of their decline. While a generalized perspective on a national population may indeed seemingly confirm this trend, fertility rates within a segment of the national population with the highest education levels may actually turn out to be quite high or on the increase (cf. Ščircelj 2006: 209). Likewise, the disparities in fertility rates among women with dissimilar levels of education are not as prominent as they were during the past century (*ibid*.). Quite the opposite: the differences have disappeared or have converted into other kinds of relations of factors.

The above statements can be scrutinised through a comparison of fertility/education data from selected regions of Slovenia with markedly different population structure, as well as through selected population groups throughout Slovenia, by examining the various aspects of the relationship (correlations and co-variations). The results are based on empirical data analysis collected in two field surveys. The first one was carried out in 2001 in three socio-economically and regionally-geographically distinctly structured areas of Slovenia,[1] on a sample of parents of children of mandatory schooling age (Josipovič 2002; 2004). The second survey is from 2004 and was carried out on a sample of immigrant population in Slovenia (Josipovič 2005; 2006). Data from these two surveys are contrasted to Census data from 1991 and 2002 which are summarised bellow.

Analysis of official statistical data[2]

Educational structure of the population exceeding 15 years of age and surveyed by the 1991 Census can first be organised according to gender. Additionally, seven groups can be formed based on highest educational level achieved. The first, and the smallest group is comprised of individuals who have three or less years of elementary school completed. The second group consists of individuals with four to seven years of elementary school completed. The third group brings together individuals with elementary school completed. The fourth is comprised of individuals with completed vocational secondary schooling. The fifth group draws together individuals with completed four-year secondary education. The sixth category groups individuals with specialised post-secondary education

[1] The three selected regions in Slovenia are: the county of *Domžale* which lies at the eastern outskirts of the Slovenian capital Ljubljana, a highly urbanized, socio-economically and geographically tertiarised area known for the high average incomes of the population, and excellent living conditions; the central Slovenian region of *Zasavje* that is one of the most heavily industrialised; and the region of *Prekmurje* in the north-eastern corner of Slovenia at the triple border between Austria, Hungary and Croatia that is one of the least economically developed regions of Slovenia with a high share of agricultural and rural population.

[2] A thorough discussion of pertinent data can be found in Josipovič 2004: 98-101.

that corresponds to college level education. The seventh group consists of the university-educated and those with post-graduate education.

The shares of population in the individual education groups vary considerably across three regions. The third group has the highest shares in population in all three, thus corresponding closely to the national average. Considering the general education level, the administrative unit of *Domžale* is generally above national average, while *Zasavje* and *Prekmurje* lag behind. All three regions have similar shares of population in the second, fourth and fifth education groups. The fifth group is most numerous in *Domžale*. The shares in the sixth and seventh group are similar across the three regions and neither exceeds five percent of total populations.

As regards gender, the higher share of women in the lower (first to third) education groups is evident. In the fourth group, men prevail significantly. In the fifth group, women are again in a slight advantage everywhere but in *Zasavje*. In the sixth group, women are in slight predominance, while men are so in the seventh. The women in all three regions generally attained slightly lower education levels than men.

The statistical relationship between education and total fertility rate were then quantitatively defined. In order to do so, an Average Education Indicator (AEI) was determined as a measuring tool of education levels, and its values compared to approximate total fertility rates.[3] This comparison was run through all sets of data. The AEI was obtained by multiplying the percentages of each education group and weighted on a scale from one to seven according to the level of education completed. In this way, the first group was weighted by factor one, the second two, and so on up to the seventh group that was weighted by factor seven. Weighted shares were then summed up and the sum divided by 100 to eliminate the percents. A statistical comparison was then made between area sets of data employing a Pearson Correlation Coefficient (PCC). The calculations revealed that the AEI ubiquitously negatively correlates with approximate total fertility rate. Furthermore, the relation seems to be statistically significant at a risk of error smaller than one in a thousand. In *Prekmurje*, the correlation is the lowest (-0.244) which can be partly explained by the distinct unimodal distribution of educational groups: the third group encompasses very nearly half the entire population considered. Nevertheless, the impact of the average education level to fertility is much higher in *Zasavje* (-0.384) and even higher in *Domžale* (-0.421). It is then justifiable to expect low levels of fertility rates in areas with a generally highly educated population.

The method of data accumulation employed by the Statistical Office of Republic of Slovenia (SORS) in the 2002 Census does not permit for the above extrapolation for small settlements. Therefore, the above calculation is only possible based on the 1991 Census data set. Still, the 2002 Census data permit the extraction pertaining to geographical areas larger than settlements or counties (e.g. regions) which confirms the correlations

[3] Approximate total fertility rate is a synthesis fertility indicator which complies in value with total fertility rate indicator. Due to its robust size, it is more convenient for use in smaller geographical units. More on this indicator in Josipovič 2002; 2004: 30-31.

above. The *Prekmurje* region, the average education indicator is 2.89 and is thus significantly lower than the national average (3.21). The same is true for *Zasavje* (3.05). Only the region of *Domžale* (3.31) surpasses the national average. Hence, it can be concluded that although the national average is on the rise, the proportions between the three regions remain the same.

Analysis of survey results

Basic features of studied population

The indicators employed so far say little about why fertility behaviour has changed historically, or how the levels of education affect it. It is impossible to answer these questions by analysing statistical data alone. More in-depth methods such as individual life histories are required. Individual histories reveal certain predispositions in fertility behaviour: the so-called inherited patterns that behave as past reinforcements (cf. Skinner 1965; 1976; Ingvarsson and Morris 2004), and digests of such family histories as upgrades in fertility decisions. A chronology of crucial life events is most helpful to identify fertility-related behaviour patterns of an individual. The employed in-depth inquiry aimed at obtaining such chronologies.[4]

The people interviewed for life histories all represent a population of parents of children in the first-grade of eight-year primary school, and/or second-graders in the then introduced new state system of nine-year primary schools in the 2000/2001 academic year. The average age of the surveyed fathers (presented as year of birth) is almost identical in the *Zasavje* and *Domžale* samples (1964). In *Prekmurje*, the average year of birth is 6 months later than in other two samples. Among mothers, the discrepancies are more pronounced, but still inside one year. The average age of women is the lowest in *Prekmurje* while in *Zasavje*, it is higher. The average age difference between women and men is lowest in *Domžale* (2.3 years). In *Prekmurje* it is little less than three years, and in *Zasavje*, 3.2 years. Compared to the differences in age relations in their own parents, the surveyed couples' parents demonstrate larger differences in age. These range between 3.2 and 3.9 years in all three sets of comparisons. Comparison between the two generations of fathers and mothers shows that age differences between spouses are smaller in the younger generations. Nevertheless, the old-fashioned model of an older husband and a younger wife clearly persists (cf. Boh 1988; Černič Istenič 1998).

The survey obviously predominantly encompassed families in which both parents are present. The share of families with both parents was 92.0 % in *Prekmurje*, 94.8 % in *Zasavje* and 90.8 % in *Domžale*. Single-parent families were thus few and feature pre-

[4] Methodological details are presented in Josipovič 2004. To briefly summarise: the survey was anonymous and referred to both parents. Aside from the general data, included were sets of questions in relation to demographic and wider socio-economic structure of the selected population: The emphasis was on education. The acquired data were then classified and grouped, and analysed area to area through systematic comparison with the Census data. The survey data are not entirely comparable to official statistics, either due to the nature of data itself, or due to lack of statistical inquires pertaining to certain data.

dominantly a female single parent. The shares of male single-parent families out of total of single parent ones are 18.2 % in *Domžale*, 16.7 % in *Prekmurje* and 7.7 % in *Zasavje*. In all three areas, positive relationships exist between the share of single parent families and the share of male single parent families. If the former is high, the latter is high, too. However, this does not mean that there would be more female single parents where single parent families are rare. The gender structure of the surveyed population encompassed more women that it did men, since more female single parent families were found in all three locations. In *Prekmurje*, the survey included 678 women and 641 men (femininity coefficient: 1.058); in *Zasavje*, 251 women and 240 men (femininity coefficient: 1.046), and in *Domžale*, 236 women and 222 men (femininity coefficient: 1.063).

The number of children of surveyed parents

Survey data show that families with two children are prevalent in all three regions. Deviations are infrequent. The average number of children in the survey can be translated into average parity (fertility) in a given period of time. This is more or less an estimate because the younger generation has not yet concluded its reproduction. The least numerous progeny (at the time of the survey) was in *Zasavje* (1.94). In *Prekmurje*, there were exactly two (2.00) children born to a family or to a woman. In *Domžale*, the level of progeny was the highest (2.24). The average progeny in *Domžale* is by 15.5 % higher than in *Zasavje*. In this context, three issues need be emphasized. First, only the population with children was surveyed. Second, approximate total fertility rates refer to a period different than that in which the children of the surveyed families were born. Third, completed fertility rates and total fertility rates are not directly comparable due to diverse methods of calculation. Moreover, the difference between the two is to be expected because of the underestimation of total fertility rates for the last decade (cf. Josipovič 2006: 117).

To obtain more precise values of overall fertility rates in the three locations, one should include the share of childless women. In Slovenia, there exist studies that take into account this datum as well. According to Kožuh Novak et al. (1998: 90), for example, the national average obtained in surveys is 30.5%[5] . Incorporating this datum, *Domžale* would feature only 1.56 children per family or per woman, while *Prekmurje* (1.39) and *Zasavje* (1.35) would figure even lower. The longitudinal data collecting technique turned out percentages higher than transversal values. The percentages are also lower than average completed fertility rates of women in the beginning of 1990s (1.76; cf. Šircelj 1998). Our figure is higher because we included generations that are past their fertile period (e.g. age group 45-49).

Our study included all surveyed families and women regardless of age. The average age calculations were thus higher as the older generations with somewhat higher

[5] Kožuh Novak et al. employ the data from the international *Family and Fertility Survey in Slovenia* as the share of women who did not give birth yet. For age groups ranging from 25-29, 30-34, 35-39, 40-44, the shares are 18.0%, 6.9%, 3.5% and 2.6% respectively. On the basis of these national averages, we can, surmising similar relations in our three cases, calculate an average number of children for the most numerous age groups.

fertility were included. However, although the younger generations were not past their fertile period yet, the overall indicators show that their completed fertility rates will be lower compared to previous generations (Kožuh Novak et al. 1998; Diagrams 5 to 7). The 2002 census data confirm this. In *Zasavje* (23.4%), the share of childless women is the lowest (23.4%). *Prekmurje* yields a slightly higher share (24.4%), while in *Domžale*, it is the highest (29.2%); the state average of childless women is at 26.5%. Applying these shares, the fertility rates are as follows: *Prekmurje* 1.51; *Zasavje* 1.49; and *Domžale*, 1.59. Thus, the share of childless women is a factor which buffers the differences between regions.

Completed fertility rates by generations render a still clearer picture. In Table 1, the generations are summed up in five-year birth date cohorts. The trend of reduction of completed fertility rates is obvious in all three regions. The most 'stable' are the conditions in *Domžale*. The data for *Zasavje* and *Prekmurje* are equivalent, although in the latter, the fertility of younger generations is somewhat higher. One nevertheless has to bear in mind that the younger generations have all but ceased to give birth. Still, if we are to consider the family with two children as a norm where the mother gives birth to the first child at the approximate age of 28, it is obvious that the effective fertility period finishes well before their 49th year of life, and often before the age of 35 (Kožuh Novak et al. 1998: 40).

Table 1: Average number of children (ANC) by generations in studied areas in 2001

area	Prekmurje		Zasavje		Adm. unit Domžale	
generations	n	ANC	n	ANC	n	ANC
1950-1959	40	2,98	14	2,71	21	3,14
1960-1964	118	2,14	55	2,15	38	2,16
1965-1969	236	2	77	2,16	104	2,13
1970-1977	220	1,74	85	1,72	54	2,19

Source: 2001 inquiry

The average number of children in the population surveyed can be systematised into five-year age groups (Table 2). Compared to data in Table 1, differences appear due to the different method of aggregation.

The key finding is that the generations conclude their reproduction in the age group from 35-39 years of age in all three locations. In *Domžale*, the differences in fertility between age groups are the smallest. Furthermore, the age group from 30-34 already comes very near to self-replacement level. In *Prekmurje*, and especially in *Zasavje*, the younger age groups delay childbirths despite the fact that the oldest groups in both areas exceed the *Domžale* area. We are thus witnessing a more intense transition in fertility behaviour in *Prekmurje* and *Zasavje* than in *Domžale*. The main causes are birth-postponement, and the reduction of the average number of children. The result is a rapid change of age structure. Furthermore, there are parallel processes of postponing first birth and temporal concentration of subsequent births in the *Domžale* region where parents postpone the first childbirth, but have the rest of offspring in quick succession. Hence, it

Table 2: Average number of children in families by five-year age groups and by gender in Prekmurje in 2001

	MEN			WOMEN		
age group	N	average number of children	Share	N	average number of children	Share
25-29	29	1.72	5,00%	121	1,72	19,70%
30-34	204	1.89	35,20%	265	1,88	43,10%
35-39	184	1.98	31,70%	161	2,13	26,20%
40-44	123	2,1	21,20%	55	2,57	8,90%
45-49	28	2,61	4,80%	9	3	1,50%
50-54	10	2,9	1,70%	4	2,75	0,70%
55-59	2	6	0,30%	-	-	-
PREKMURJE	580	2.02	100,00%	615	2	100,00%
30-34	68	1,69	29,60%	1	3	0,40%
35-39	96	2,01	41,70%	47	1,7	19,50%
40-44	40	2,2	17,40%	94	1,78	39,00%
45-49	12	2	5,20%	68	2,12	28,20%
50-54	5	2,2	2,20%	27	2,26	11,20%
55-59	1	2	0,40%	4	3,25	1,70%
ZASAVJE	230	1,94	100,00%	241	1,94	100,00%
30-34	8	2,13	3,90%	31	2,1	14,30%
35-39	60	2,13	29,60%	87	2,21	40,10%
40-44	91	2,22	44,80%	70	2,12	32,30%
45-49	25	2,32	12,30%	16	2,5	7,40%
50-54	11	2,45	5,40%	10	3,1	4,60%
55-59	5	4	2,50%	3	3,67	1,40%
60-64	3	3	1,50%	-	-	-
DOMŽALE	203	2,27	100,00%	217	2,25	100,00%

Source: 2001 inquiry

is reasonable to argue that this pattern is generic in socially and economically stable suburban areas.[6]

[6] These results may also have been influenced by low or unequal response ratio. In our case, the age structure of parents who did not respond to the survey can be calculated indirectly. One can compare official yearly age-specific fertility rates with inquiry data for corresponding years. Another way to compare the actual and surveyed populations is through total fertility rate in the year in question. Both tests of inquiry data show that no essential disparities occurred.

Table 3: Estimated average number of children in most numerous age groups

Age groups	Prekmurje	Zasavje	Adm. unit of Domžale
25-29	1,41	1,39	-
30-34	1,75	1,66	1,96
35-39	2,06	2,05	2,13
40-44	2,5	2,2	2,06

Source: 2001 inquiry; Kožuh-Novak et al. 1998

Table 4: Comparison of age-specific fertility rates and total fertility rates between official statistical data and inquiry data for 1993

Official statistical data	Total fertilit	age-specific fertility rates						
		15-19	20-24	25-29	30-34	35-39	40-44	45-49
Prekmurje	1317,07	25,31	109,56	81,62	36,91	8,34	1,67	0
Prekmurje (survey)*	1321,24	12,31	96,63	103,59	38,98	10,25	2,48	0
Zasavje	1245,32	18,71	96,28	87,36	37,21	7,79	1,71	0
Zasavje (survey)*	1261,94	15,38	115,01	71,45	42,28	6,99	1,28	0
Domžale	1389,62	12,18	88,75	108,57	46,89	17,66	3,87	0
Domžale (survey)*	1388,78	11,23	84,8	113,71	49,62	11,7	6,69	0

Source: unpublished data, SORS; 2001 inquiry; note: for more precision the values for total fertility rate was not divided by 1000

There are, potentially, other factors like migration or education which could, technically, influence the validity of calculated age structure. However, the pertinent data were lacking.

Proto-genetic and inter-genetic interval of surveyed population in relation to education

The age of women at the time of their first childbirth is sometimes referred to as the proto-genetic interval (PGI).[7] It stands for the theoretic assumption that the earlier the first childbirth, the more children will be born to the same woman. By extension, the PGI also stands for the assumption that more educated women will bear children later in life, and will have fewer. Accordingly, the average age of women at the time of their first childbirth was 22.7 years in *Zasavje*, 23.3 years in *Prekmurje*, and 23.8 years in *Domžale*. The PGI does not behave predictably in any of the three locales. In *Zasavje*, women have their firstborns early in life, but have the least children. In Domžale, the situation is reversed. In Prekmurje, it is balanced between these two extremes. With respect to education levels, the more educated population of parents in Domžale displays longer PGI, as do educated parents in other two locales; however, the latter have markedly fewer children. Compared to women, the age of men when they first became fathers was approximately the same in all three regions: a little over 26 years.

[7] Proto-genetic interval is known by various names and definitions in literature. Because it derives from Greek expression 'proto-genesis', it could be translated in 'proto-genetical', to avoid potential confusion with the meaning of 'genetic'.

As concerns inter-genetic interval (IGI),[8] the three regions are markedly different. In *Prekmurje* and *Domžale*, the average inter-genetic interval (IGI) is a little less than four years, and exceeded by *Zasavje's* five years. The second IGI is six months longer than the first one in *Prekmurje*, one year longer in *Zasavje*, and equals to the first one in *Domžale*. The subsequent IGIs hardly apply as the fourth and higher-grade births are rare.

To summarize: the average age of women at the time of childbirth is between 25.0 (*Zasavje*) and 26.1 (*Domžale*). The average age of men was again comparable and ranging between 28.1 (*Prekmurje*) to 28.4 (*Domžale*). All three locations were tested as to the argument persistent in demographic literature (e.g. Kožuh Novak et al. 1998) to the effect that the shorter the PGI, the higher the women's completed fertility. In all three locales, this seems correct, although the correlations measured with Pearson's coefficient are not particularly high. They range between -0,185 (P<0.01)[9] in *Zasavje* and -0,215 (P<0,001) in *Prekmurje*, and up to -0,286 (P<0,001) in *Domžale*. Given the complexity of fertility behaviour, the measured correlations read as fairly high.

Interdependence of age, gender and education

We have seen that the average level of education negatively correlates with the general fertility level. In the next step, I compared the level of education with the levels of progeny (the average number of children per woman/family)[10] . The results show significant processes which can have long-lasting consequences for fertility in Slovenia.

The paralleling of fertility rates to gender and level of education shows that with the elevation of education from Level 4 in our systemisation, fertility level also starts to rise; however, the fertility rate (the number of children) does not climb at the same pace with both genders. With men, it starts to increase as late as with 6th or 7th level of education. With women, the turning point is after Level 5 of education. Among men, the number of children[11] rises above simple reproduction level[12] (values of 2.1 child or more per woman), while among women, those values do not reach 2.0. One could say that increasing education rate promotes only men's total progeny. In-depth analysis, however, says more. In *Prekmurje*, the former conclusion seems valid. However, a closer look into the structure of families shows that a substantial share (7.9%) of difference between genders represents single parent families.[13]

[8] The inter-genetic interval represents the time-length between each consecutive birth. Thus the first inter-genetic interval refers to time-distance between first and second birth, the second inter-genetic interval refers to second and third birth, and so forth.

[9] Statistical risk is lower than one in a hundred.

[10] By progeny, I here mean the number of children that a woman or a family has at the time of survey. Progeny usually stands for completed fertility (total progeny or total descendants) of women who have reached the end of their fertile period.

[11] Only two-parent families are considered.

[12] The level of simple reproduction stands for the average number of children who should be born in order to numerically substitute active generations who are giving births. The total fertility rate of 2.1 is widely used as the delineation point between bellow replacement level and simple reproduction level.

[13] Inquiry data show the following shares of single parent families: Zasavje (5.2%), Prekmurje (7.9%), and Domžale (9.2%).

These relationships are the key to understanding the correlation between single-parenthood and fertility. The majority of parents in a single parent family situation are separated (divorced); fewer are widowers. In cases of separation of living parents, the overwhelming majority of children (85%) in Slovenia remain with their mothers[14] who are now, statistically speaking, in a situation of diminished probability of the next pregnancy; their conceiving exposure period (CEP) statistically shortens. In other words, these women stand a reduced chance of achieving a higher birth order. Thus, the completed fertility rate of these women is lowered. Consequently, their lower fertility is statistically seen as closely related to education, since beyond the 4th level of education, fertility is not increasing at the same pace as it does among men.

If we now eliminate the impact of single parent families regardless of gender, the picture becomes clearer. The distribution of fertility across the span of seven levels of education of single-mothers becomes unimodal as the average number of children is drastically decreasing with the rising level of education. With the 7th level of education, it drops to a mere 1.0 child per woman. That explains why educated women display a somewhat lower level of progeny compared to men. However, if we exclude the impact of single-parent families, the fertility of women with 7th level of education reaches the level of simple reproduction, just as the men's does. In this way, we see that it is due to a statistical misrepresentation that the highly educated women are subject to the prejudice which portrays them as purposefully infertile, or that high education persuades women not to bear children.

In order to evaluate the intensity of the statistically curved relationship between fertility and education, I used a statistical measure called correlation ratio (CR, η). Employing this measure, *Prekmurje* shows a statistically important ($P<0.01$) relationship between education and the number of children in families for both genders. The relationship is accentuated when the influence of single parent families is eliminated. The statistical relationship is higher for men in both cases, which may be due simply to the relative lack of highly educated women.

In other two regions, the circumstances are different. In *Zasavje*, a statistically important relationship between education and number of children in the family does not show as the quantifiable differences are too small across education, age and gender groups. The same is valid for *Domžale*. However, there is in Domžale a statistically significant ($P<0.05$) relationship between the number of children per family and the education level of mothers regardless of the family type. The curved relationship is especially visible when the share of single female parent families is excluded from calculation. The surveyed families have, on average, more than two children regardless of the level of education, or the type of family.

[14] According to official Slovenian statistics, on the national level, 85% of children stay with their mothers after the couple parts ways. Thus only 15% of children live with their (single) father.

In all the locales, deploying the so-called dispersion diagram will render, unlike the employment of the PCC, prominently curved dependencies between education and fertility. To avoid the effect of diverse age structures of selected populations on our calculations, the educational structure can be further analysed by the age of the women encompassed with regard to the numbers of their children. To ensure the comparison under comparable statistical conditions, single-parent families are excluded. Table 5 depicts, in all three locales, the average number of children per woman with respect to age and education level. Women are divided into two age groups. The intersection point was calculated at the age of 35 which coincides, statistically speaking, to the anticipated point of completed fertility in the national average. Past the age of 35, only 5% of women still bear children (Kožuh Novak et al. 1998: 40). The data in Table 5 explicates the above relations. Hence, differentiation by age did not influence former conclusions.

In *Prekmurje*, the 'progress' of the highly educated (Level 7) generations of women younger than 35 years of age who now give more births than women in lower education categories is clearly visible, especially in comparison to women with education Levels 4 and 5. A more prominent difference is shown in the group of 35+ year-olds, where women with elementary education or less have 2.62 children per woman. In *Zasavje*, the relations are not as prominent. Women under 35 generally have less children then women in *Prekmurje* and *Domžale*. It is noteworthy that women of 35 years or more gave births in a similar dynamics in other two regions as well. In *Domžale*, women under 35 years of age already attain self-replacement levels of fertility. In this regard, the *Domžale* locale parallels *Prekmurje* since in both, highly educated women in this age group already realise an above-national fertility rate.

Table 5: Average number of children with regard to education level and age group of mothers

Source: 2001 inquiry

	less then 35 year-old			35 year-old and more			Total		
Education group	Nr	of children	Percentage	Nr	of children	Percentage	Nr	of children	Percentage
1	1	4,00	0,3	0	0	0	1	4,00	0,2
2	6	2,00	1,7	3	4,00	1,5	9	2,67	1,6
3	80	1,89	22,2	34	2,50	16,6	114	2,07	20,1
4	129	1,84	35,7	48	2,15	23,4	177	1,93	31,3
5	109	1,84	30,2	60	2,28	29,3	169	2,00	29,9
6	26	1,69	7,2	37	2,19	18,0	63	1,98	11,1
7	10	1,90	2,8	23	2,17	11,2	33	2,09	5,8
Prekmurje	361	1,85	100,0	205	2,28	100,0	566	2,01	100,0
2	2	2,00	1,5	6	2,00	6,3	8	2,00	3,5
3	33	1,94	24,6	20	2,35	21,1	53	2,09	23,1
4	37	1,70	27,6	14	2,29	14,7	51	1,86	22,3
5	48	1,67	35,8	38	2,24	40,0	86	1,92	37,6
6	4	1,75	3,0	9	1,89	9,5	13	1,85	5,7
7	10	1,70	7,5	8	2,13	8,4	18	1,89	7,9
Zasavje	134	1,75	100,0	95	2,21	100,0	229	1,94	100,0
2	0	0	0	3	3,33	3,5	3	3,33	1,5
3	14	2,29	12,4	8	2,25	9,3	22	2,27	11,1
4	32	2,34	28,3	13	2,92	15,1	45	2,51	22,6
5	49	2,12	43,4	29	2,25	33,7	78	2,17	39,2
6	9	2,11	8,0	23	2,13	26,7	32	2,13	16,1
7	9	2,33	8,0	10	2,30	11,6	19	2,32	9,5
Domžale	113	2,22	100,0	86	2,36	100,0	199	2,28	100,0

The above depiction of the situation in *Domžale* may be interpreted as indicating a novel demographic trend: in *Domžale*, one could say that the higher the education, the more children people will have. Speaking of the decisive fertility factors, it looks like the circumstances of presumably better socio-economic conditions, as there exist in *Domžale*, correlate with higher fertility rates. In corroboration on the level of interpretation as it exists in the field, the especially highly educated younger generations have, in the interviews conducted, expressed a prevailing opinion that fertility in Slovenia is indeed a problem, although most of them already have at least two children. In *Domžale,* the PGI is also longer compared to the other two regions, which, again, goes against the axiom that a higher total fertility rate means also shorter PGI. People in *Domžale* tend to have children later in life, but they also fairly quickly reach the planned number of children.

Conclusions: fertility vs. education dualism

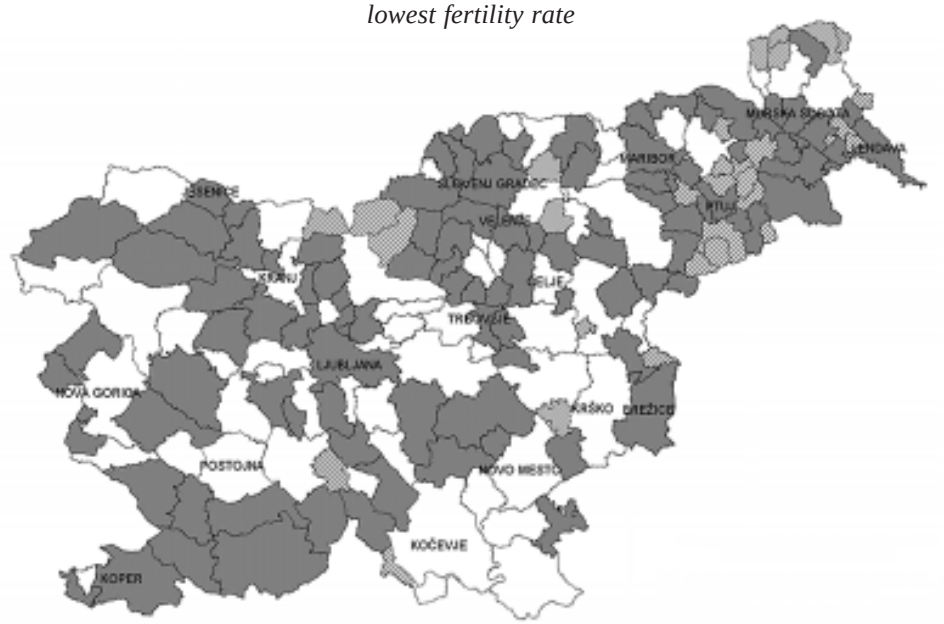
The above analyses are based on data sources such as official statistics, the census, and my own research. The results in all three locales demonstrate relations between levels of education and fertility that are somewhat different than those found in literature. The latter generalises that higher education in parents means fewer children.

One could question the choice of the cases presented in their validity on the national plane. Let me emphasise again that the national average shows negative linear correlation between education and fertility. Since averages are frequently misleading, let us have an additional look at the discrepancies in fertility behaviour in a local population at the level of municipalities, as these are recorded by the 2002 Census. The datum to look for is the average number of children of Level 7-educated women at the end of their fertile period (age group 45-49). The geographical distribution of the share of these women in the national population shows that there are as many as 46[15] municipalities where fertility rates of highly educated women exceed those of at least three preceding educational groups of women (Map 1). Do highly educated women really have overall lowest fertility rates? The women with university education (Level 7 education) of the age group from 45-49 do not score the lowest fertility rate in as many as two thirds[16] of Slovenian municipalities (Map 2).

[15] Out of 192 municipalities in Slovenia at the time of the 2002 census, 31 feature no highly educated women of this age group. Thus 46 municipalities account for 28.6% of the total.
[16] 105 out of 161 municipalities amount to 65.2 percent.

Map 1: Municipalities where Level 7 educated women score larger than average number of children

Map 2: Municipalities where women with university education score higher than the lowest fertility rate



Both phenomena are unevenly distributed in Slovenia. Distinctively high fertility rates of highly educated women exist in central and north-eastern parts. The second is actually pan-Slovenian while the first is present mainly in the rural and suburbanized areas, and only three out of 13 major cities. The second is present in nine urban municipalities including Ljubljana and Maribor.

These data clearly do not support a linear relationship between fertility rates and advanced levels of education. The education vs. fertility relationship is far more complex: it goes all the way to situations where synchronous dichotomies, or at minimum multidirectional developments, are probable. Speaking of dichotomies, I use this term to describe the imminent duality to all demographic processes when projected into the geographical space. It is indisputable that on average, higher education does mean less children compared to, say, the national average of fertility of the less educated. On the other hand, the processes of suburbanization of the countryside around large cities attract the more educated and well-to-do middle-class populations who obviously also realise high fertility rates. Speculatively, one of the intervening processes is the different worldview among these populations. In this context, it can be better understood why the suburban middle class in *Domžale* believes that fertility in Slovenia is going through a crisis[17] , although their average number of children peaks at 2.44. However, the fertility of highly educated women who did not conform to this view, only have 1.33 children per woman. The opinion gap between the two groups is expressed in the datum that the share of so-called 'problematists' is as high as 75% (cf. Knežević Hočevar 2006).

This phenomenon is neither geographically nor socio-economically isolated. The survey carried out in 2004 on a representative sample of immigrants to Slovenia from other republics of former Yugoslavia posed identical questions (Josipovič 2006). Regardless of ethnicity, the similarities in fertility behaviour are astonishing despite the common prejudice that immigrants are more fertile than native population. Here, the relationship between education and fertility is also expressed in the form of pronounced statistical curve especially in women ($\eta=0.204$; $P<0.01$). The point remains that fertility is higher in populations of both genders with tertiary level education than in those with secondary.

Thus the relationship between average level of education and average number of children is simply an inadequate comparison where fertility behaviour of the highly-educated is concerned. Between education and fertility, there exist specific relations which are statistically better explained through the use of curvilinear statistical indicators. Generally, there may appear a negative correlation. However, in order to obtain a more meaningful result, education is profitably broken down into several subgroups of levels each of which may demonstrate highly specific behaviour. In other words, differentiating between diverse levels of education reveals, at the very least, gradual negative linear trends in the education-fertility relation.

[17] More on why is low fertility 'problematic' in Knežević Hočevar 2006.

Moreover, education as an ordinal statistical variable is structurally differently organised than fertility. Put simply, it measures a phenomenon of a radically different kind. Only when duly processed, e.g. broken down into subgroups, can education be tested for its non-linear effects on a long-term behaviour such as fertility, and can it demonstrate statistically valid correlations. Thus, the lower plateau of fertility occurs in populations with Levels 4 and 5 education, but dissipates with the rising level of education. This is in contrast to the situation in early 20th century when absolute minimum fertility rates were characteristic of the Level 7 educated population.

The role of education in fertility behaviour has to be understood in the context of the long-term fertility decline in Slovenia and in other 'developed' countries[18] . It is unrealistic to expect sudden radical changes in fertility behaviour. We also should not expect inventions of a redeeming factor in the field of fertility theory that would explain all the theoretical qualms. There exist neither simple reasons for, nor straightforward causes and effects between, education and fertility. To want for a solution means to want to introduce ideological interventions into theoretical thinking.

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[18] For a critique of explanatory nature of the second demographic transition theory, see Knežević Hočevar 2006: 195-201.

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Povzetek

V pričujočem prispevku avtor presoja odnos med izobrazbo in rodnostjo, da bi ponovno ovrednotil oz. prevrednotil bolj uveljavljene demografske poglede na to razmerje. Izobrazba kot eden izmed ključnih dejavnikov rodnostnega vedenja je namreč v demografski literaturi gledana kot linearno, in že kar avtomatično povezana z rodnostjo. Da bi presegel tako poenostavljeno gledanje, avtor v svoji raziskavi uporabi več-disciplinarni pristop. Zatrjuje namreč, da razmerje med izobrazbo in rodnostjo ni enostavno linearno, temveč je izrazito prepleteno v medsebojnih odvisnostih. Proučevano razmerje med izobrazbo in rodnostjo analizira na primeru skupin prebivalstva na treh geografsko in družbenoekonomsko različno strukturiranih območjih Slovenije in med posameznimi izobrazbenimi skupinami po Sloveniji. Analiza je pokazala, da se odvisnost rodnosti od izobrazbe kaže v obliki krivulje in ne ravne črte. Analiza je tudi pokazala, da se razlike v rodnosti med posameznimi izobrazbenimi skupinami po Sloveniji in po treh tipskih območjih skozi čas zmanjšujejo ter preraščajo tudi v drugačna medsebojna razmerja.

KLJUČNE BESEDE: izobrazba, rodnost, dejavniki rodnosti, Slovenija