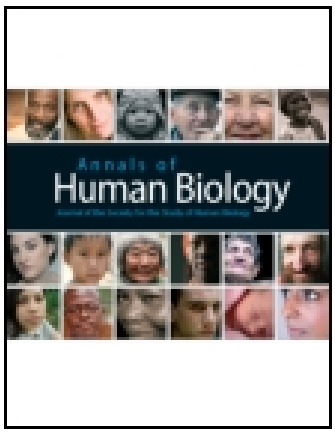

Annals of Human Biology
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/iahb20

Educational and social class assortative mating in fertile British couples

Monika Krzyżanowska[a] & C. G. Nicholas Mascie-Taylor[b]
[a] Department of Human Biology, University of WrocławPoland
[b] Department of Archaeology and Anthropology, University of CambridgeUK
Published online: 22 May 2015.

Annals of Human Biology
Journal of the Society for the Study of Human Biology

http://informahealthcare.com/ahb
ISSN: 0301-4460 (print), 1464-5033 (electronic)

Ann Hum Biol, 2014; 41(6): 561–567
 DOI: 10.3109/03014460.2014.903996

informa
healthcare

RESEARCH PAPER

Educational and social class assortative mating in fertile British couples

Monika Krzyżanowska[1] and C. G. Nicholas Mascie-Taylor[2]

[1]Department of Human Biology, University of Wrocław, Poland and [2]Department of Archaeology and Anthropology, University of Cambridge, UK

Abstract

Background: Positive assortative mating for education and social position has been widely reported in a number of countries, but very few studies have tested whether or not educational or social class homogamy is related to differential fertility.
Aim: This study examined the relationship between educational and social class assortative mating and fertility in a British national cohort.
Subjects and methods: The analyses were based on 7452 husband–wife pairs from the British National Child Development Study (NCDS).
Results: The mean fertility was 3.22 children per couple; the number of children significantly increased from higher to lower social classes and from the more educated to the less educated. The extent of assortative mating for social class and educational level was related to fertility; as educational assortative mating decreased so did the average number of children, whereas the opposite trend was observed for social class. When assortative mating for education and social class were considered together, educational assortative mating was the more significant predictor of the number of children and educationally homogamous couples had higher fertility independent of their social class assortative mating.
Conclusions: The relationship between assortative mating and fertility for education and social class appeared to be acting in the opposite direction.

Keywords

Assortative mating, education, fertility, NCDS, social class

History

Received 20 August 2013
Revised 16 January 2014
Accepted 26 February 2014
Published online 10 April 2014

Introduction

Phenotypic assortative mating, when like mate with like, has been reported for a wide variety of characteristics including age (Speakman et al., 2007), educational attainment (e.g. Correia, 2003; Hur, 2003; Huber & Fieder, 2011; Lewis & Oppenheimer, 2000; Mare, 1991), socioeconomic status, political orientation, region (Mascie-Taylor, 1987), ethnicity (Morton et al., 1967), religious background (Kalmijn, 1991b) and physical characteristics, such as facial appearance (Zajonc et al., 1987), height, weight (Pearson and Lee; quoted in Beckman, 1962; Mascie-Taylor, 1987; Seki et al., 2012), Body Mass Index (BMI) (Speakman et al., 2007), skin, eye and hair colour as well as psychological traits and behaviour, i.e. intelligence, interests and hobbies, attitudes, personality and mental retardation (Glicksohn & Golan, 2001; Keller et al., 1996), cigarette smoking and alcohol consumption (Agrawal et al., 2006). In general, the association between partners is strong for age, political orientation and other social attitudes and religiosity, moderate for intelligence, education and physical attractiveness and weak for height, weight and personality traits (Zietsch et al., 2011).

Negative assortative mating (*disassortative mating*), where opposites mate, is much rarer in humans and the most cited examples are red hair colour among Europeans (Stern, 1973) and albinism in the Hopi Indians (Woolf & Dukepoo, 1969).

A number of studies have described the tendency for persons to choose partners of similar educational attainment (*educational homogamy*) (Lewis & Oppenheimer, 2000; Mare, 1991; Schoen & Weinick, 1993). Assortative mating based on education is used as an indicator of societal openness and is important for social stratification because of the role that education plays in the distribution of individuals' aspirations, goals, lifestyles and common interests (e.g. Blossfeld & Timm, 2003; Kalmijn, 1991a; Mare, 1991; Qian, 1998; Raymo & Xie, 2000).

Although positive assortative mating for education and social position has been widely reported in a number of countries (Blossfeld & Timm, 2003; Gustafsson & Worku, 2005; Kalmijn, 1991b; Katrňák et al., 2006; Schwartz & Mare, 2005) very few studies have tested whether or not educational or social class homogamy is related to differential fertility (Bereczkei & Csanaky, 1996; Huber et al., 2010; Huber & Fieder, 2011; Mascie-Taylor, 1986; Tsou et al., 2011). The present study examines the relationship between assortative mating and fertility for educational level and social class in a British national cohort.

Correspondence: Monika Krzyżanowska, Department of Human Biology, University of Wrocław, Kuźnicza 35, 50–138 Wrocław, Poland. Tel: +4871 3752512. Fax: +4871 3752697. E-mail: emka@antropo.uni.wroc.pl

Materials and method

The data were collected as part of the National Child Development Study (NCDS), the longitudinal survey of all children born in England, Wales and Scotland in the week 3–9 March 1958. The children and their families were periodically re-studied in 1965, 1969 and 1974. Thereafter the index child was followed up into adulthood and then re-studied at 33 and 40 years of age. This paper focuses on the 7452 husband–wife pairs (the parents of the index child) for whom there were fertility data as well as information about their level of education and social class. The study was limited to couples who have had at least one child.

The number of liveborn offspring per family was used as the fertility measure and was collected in 1974, a date which would be close to the end of the reproductive span for most of the mothers, since their average age would then have been 44 years.

Educational attainment was grouped into four categories of University, 'A' level, 'O' level and No qualifications. Social class was defined by the Registrar General's 6-point occupational scale, where I refers to professional, II to intermediate (mainly managerial), III non-manual skilled worker, III manual skilled worker, IV semi-skilled worker and V unskilled. Due to the smaller numbers, social classes I and II were combined. Mothers with small children are often full-time housewives and have no formal social class, so the mother's father's social class was used as a proxy of the women's position in a social scale.

To assess the extent of educational and social class assortative mating, the difference in educational level and social class position between husband and wife was noted, where the difference between each educational level and social class position was 1 unit. If the husband and wife had the same educational level or social class position the difference was 0, i.e. maximum assortative mating (homogamy), and it was set as the reference group for both variables. The difference in educational level and social class between spouses was calculated (husband – wife) and the maximum range of differences ranged from −4 to +4 for social class and −3 to +3 for education. However, as there were very few couples in the −4 and −3 or +4 and +3 categories (total ∼3%) for both variables, the range was reduced to −2 to +2. Negative values indicate higher male educational level or social class, while positive values indicate higher female educational level or social class.

To assess the relationship between spouses' education as well as social class, McNemar-Bowker's test was used. Univariate analysis of variance was the main statistical tool with Hochberg's or Games-Howell's *post-hoc* tests used to analyse variation in husband's and wife's fertility separately in relation to their educational level and social class as well as to assess the mean fertility by difference in partners' educational level and social class. In order to determine the joint effects of assortative mating for educational level and social class, sequential regression analyses initially removed the effects of differences in social class between spouses before testing for the educational differences and then removed the effects of differences in educational level between spouses before testing for the social class differences were undertaken.

All analyses were performed using SPSS version 19 (SPSS Inc., Chicago, IL).

Results

Fertility by educational level and social class

In total 7452 husband–wife pairs had complete data on the number of children, educational status and social class. The mean number of children was 3.22 (range 1–16), with a standard deviation of 1.72. Only ∼7% of families had only one child, 34% comprised two children, 27% three children and 32% four or more children.

There was significant variation in the number of children in relation to educational level and social class. As Tables 1–3 show, for both husband and wife mean fertility was least in those with university education and highest in those with no

Table 1. Fertility by husband's educational level.

	Fertility						
Husband's educational level	*n*	Mean	SD	Δ_1	*p*	Δ_2	*p*
University	566	2.86	1.15	−0.58	<0.001	−0.39	<0.001
'A' level	1000	2.77	1.25	−0.67		−0.50	
'O' level	1404	2.97	1.42	−0.47		−0.28	
No qualifications	4482	3.44	1.91	0		0	
Total	7452	3.22	1.72				

$F_{(3,7448)} = 68.374$, $p < 0.001$.
Δ_1, differences in means relative to the reference group (0).
Δ_2, differences in means relative to the reference group (0) after taking into account the effects of wife's educational level.

Table 2. Fertility by wife's educational level.

	Fertility						
Wife's educational level	*n*	Mean	SD	Δ_1	*p*	Δ_2	*p*
University	425	2.91	1.16	−0.60	<0.001	−0.32	<0.001
'A' level	1238	2.86	1.34	−0.65		−0.44	
'O' level	2229	3.01	1.45	−0.50		−0.37	
No qualifications	3560	3.51	1.98	0		0	
Total	7452	3.22	1.72				

$F_{(3,7448)} = 68.986$, $p < 0.001$.
Δ_1, differences in means relative to the reference group (0).
Δ_2, differences in means relative to the reference group (0) after taking into account the effects of husband's educational level.

Table 3. The differences between the mean fertility by husband's and wife's educational level and social class—Hochberg's or Games-Howell's post-hoc tests.

Educational level	Husband	Wife	Social class	Husband	Wife
1–2	ns	ns	I + II-III NM	ns	ns
1–3	ns	ns	I + II-III M	<0.001	ns
1–4	<0.001	<0.001	I + II-IV	<0.001	<0.001
2–3	<0.01	<0.05	I + II-V	<0.001	<0.001
2–4	<0.001	<0.001	III NM-III M	<0.001	<0.05
3–4	<0.001	<0.001	III NM-IV	<0.001	<0.001
			III NM-V	<0.001	<0.001
			III M-IV	<0.001	<0.001
			III M-V	<0.001	<0.001
			IV-V	<0.05	<0.05

1 = University; 2 = 'A' level; 3 = 'O' level; 4 = No qualifications.

qualifications. There was also a social class trend in mean fertility (Tables 3–5) with the lowest mean in social classes I and II and highest in social class V.

Educational similarity between spouses

There was considerable evidence for educational propinquity (McNemar-Bowker, 582.95, $p<0.001$) and 61.6% of the spouses had an identical level of education (40.6% of homogeneous couples had no qualifications and only 3.0% of couples had university education). Nearly a quarter (24.3%) of wives had a higher educational level than their husbands, while only 14.1% of husbands had a higher educational level than their wives (Table 6).

Table 4. Fertility by husband's social class.

	Fertility						
Husband's social class	*n*	Mean	SD	Δ_1	*p*	Δ_2	*p*
I + II	1374	2.85	1.27	−1.04	<0.001	−0.90	<0.001
III NM	756	2.88	1.33	−1.01		−0.92	
III M	3748	3.22	1.76	−0.67		−0.60	
IV	911	3.60	1.91	−0.29		−0.24	
V	663	3.89	2.08	0		0	
Total	7452	3.22	1.72				

$F_{(4,7447)} = 61.758$, $p<0.001$.
Δ_1, differences in means relative to the reference group (0).
Δ_2, differences in means relative to the reference group (0) after taking into account the effects of wife's social class.

Table 5. Fertility by wife's social class.

	Fertility						
Wife's social class	*n*	Mean	SD	Δ_1	*p*	Δ_2	*p*
I + II	1358	3.04	1.46	−0.65	<0.001	−0.40	<0.001
III NM	469	2.92	1.32	−0.77		−0.58	
III M	3431	3.12	1.64	−0.57		−0.46	
IV	1142	3.43	1.93	−0.26		−0.22	
V	1052	3.69	2.06	0		0	
Total	7452	3.22	1.72				

$F_{(4,7447)} = 34.546$, $p<0.001$.
Δ_1, differences in means relative to the reference group (0).
Δ_2, differences in means relative to the reference group (0) after taking into account the effects of husband's social class.

Social class similarity between spouses

Social class of husbands and their wives were not independent (McNemar-Bowker, 207.56, $p<0.001$); 39.9% of the spouses were from the same social class, 35.5% of husbands came from a higher social class than their wives, while 24.6% of wives were from a higher social class than their husbands (Table 7).

Fertility by educational similarity between spouses

There was very significant heterogeneity in mean fertility in relation to couples educational level and, as educational similarity increased, so did the average number of children (Table 8).

Fertility by social class similarity between spouses

There was very significant heterogeneity in mean fertility based on social class similarity of couples; as social class differences between couples increased so did the number of children (Table 9).

Fertility by educational and social class similarity between spouses

In order to determine the joint effects of assortative mating for educational level and social class, sequential regression analyses initially removed the effects of differences in social class between spouses before testing for the educational differences and then repeated with social class and educational level in the reverse order. Both analyses revealed little

Table 6. The relationship between spouses' education (percentages).

	Husband's education				
Wife's education	University	'A' level	'O' level	No qualifications	Total
University	219 (3.0)	107 (1.4)	29 (0.4)	70 (0.9)	425 (5.7)
'A' level	197 (2.6)	385 (5.2)	217 (2.9)	439 (5.9)	1238 (16.6)
'O' level	76 (1.0)	244 (3.3)	958 (12.8)	951 (12.8)	2229 (29.9)
No qualifications	74 (1.0)	264 (3.5)	200 (2.7)	3022 (40.6)	3560 (47.8)
Total	566 (7.6)	1000 (13.4)	1404 (18.8)	4482 (60.2)	7452 (100)

McNemar-Bowker's test = 582.95, $p<0.001$.

Table 7. The relationship between spouses' social class (percentages).

	Husband's social class					
Wife's social class	I + II	III NM	III M	IV	V	Total
I + II	591 (7.9)	163 (2.2)	452 (6.1)	97 (1.3)	55 (0.7)	1358 (18.2)
III NM	118 (1.6)	75 (1.0)	210 (2.8)	46 (0.6)	20 (0.3)	469 (6.3)
III M	521 (7.0)	343 (4.6)	1896 (25.4)	396 (5.3)	275 (3.7)	3431 (46.0)
IV	103 (1.4)	90 (1.2)	609 (8.2)	220 (3.0)	120 (1.6)	1142 (15.4)
V	41 (0.6)	85 (1.1)	581 (7.8)	152 (2.0)	193 (2.6)	1052 (14.1)
Total	1374 (18.5)	756 (10.1)	3748 (50.3)	911 (12.2)	663 (8.9)	7452 (100)

McNemar-Bowker's test = 207.56, $p<0.001$.

Table 8. Fertility by partners' educational homogamy.

	Fertility						
Difference in education	*n*	Mean	SD	Δ_1	*p*	Δ_2	*p*
−2	414	2.92	1.46	−0.43	<0.001	−0.43	<0.001
−1	641	2.89	1.39	−0.46		−0.44	
0	4584	3.35	1.84	0		0	
+1	1275	3.09	1.51	−0.26		−0.25	
+2	538	3.04	1.56	−0.31		−0.31	
Total	7452	3.22	1.72				

Δ_1, differences in means relative to the reference group (0).
Δ_2, differences in means relative to the reference group (0) after taking into account the effects of differences in social class between spouses.

Table 9. Fertility by difference in partners' social class.

	Fertility						
Difference in social class	*n*	Mean	SD	Δ_1	*p*	Δ_2	*p*
−2	956	3.34	1.89	0.22	<0.001	0.22	<0.001
−1	1452	3.17	1.77	0.05		0.07	
0	3347	3.12	1.59	0		0	
+1	1176	3.25	1.69	0.13		0.13	
+2	521	3.68	2.01	0.56		0.54	
Total	7452	3.22	1.72				

Δ_1, differences in means relative to the reference group (0).
Δ_2, differences in means relative to the reference group (0) after taking into account the effects of differences in educational level between spouses.

change in means (delta 2 in Tables 8 and 9), although assortative mating for educational level was more significant and had a greater effect size than social class in predicting fertility (0.100 and 0.084, respectively).

The difference in partners' educational level and social class simultaneously were combined into nine categories, where 0 refers to educational or social class homogamy and M> or F> refer to higher male or female education, respectively (Figure 1). There was very significant variation in mean fertility between the nine categories ($F_{(8,7443)} = 11.847$, $p < 0.001$). The highest fertility was found in the three categories where educational level was the same.

Discussion

The mean fertility in this British cohort of fertile couples was 3.22, which is higher than in other British National data. For example, the Office for National Statistics (cited by Whiting, 2010) found the mean fertility was ∼3 (after correcting for childless couples) in the cohort of women born between 1935–1945. Just over a third of families in this study had two children, which has been the most common family size for the last 70 years in Britain (Whiting, 2010). However, it should be noted our study was limited to couples who have had at least one child.

Higher education has been almost universally found to be associated with lower fertility in the UK (e.g. Rendall & Smallwood, 2003) as well as studies based on the World Fertility Surveys and Demographic Health Surveys

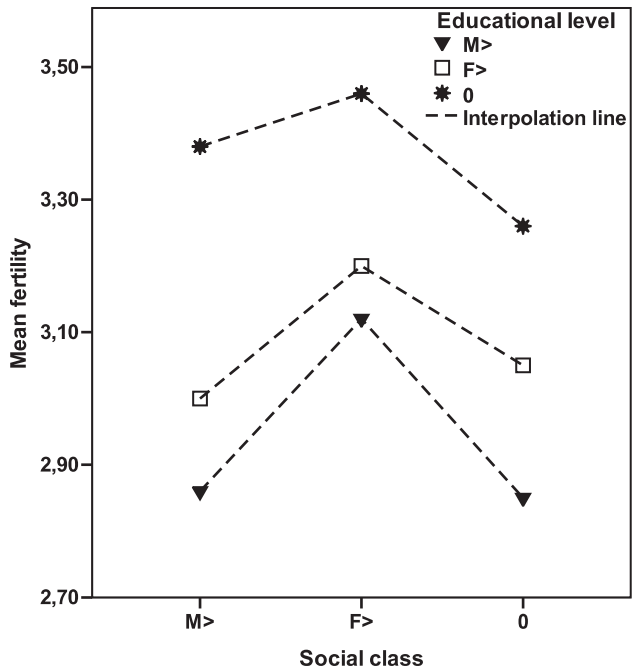

Figure 1. Fertility by difference in partners' educational level and social class (0 = homogamy, M> = male hypogamy, F> = female hypogamy).

(Kremer & Chen, 2002) in developed and developing countries. The World Fertility Surveys conducted in 13 European countries and the US found that women with less than elementary education had a Total Fertility Rate of 2.40 children on average, those with elementary education had 2.17 children and those with secondary education and above had 1.79 children. Data from the US National Survey of Families and Households showed that, among women of 35–44 years of age in 1990, high school dropouts had a mean of 2.77 children, which fell to 2.22 for those with high school degrees, 1.95 for those with bachelor's degrees and 1.43 for those with graduate degrees (Kaplan et al., 2002).

The results of this study are in broad agreement in showing a reduction in fertility between university educated and those with no qualifications of ∼0.6 children.

The effect of the level of education of women on fertility is often explained by the ''independence hypothesis'' (Martín-García & Baizán, 2006), which predicts that the higher the level of education a woman has, the longer she will postpone or avoid motherhood. More-educated women tend to marry later, enter the labour market and tend to belong to groups with different social norms than those less educated. In other words, better educated women have greater reproductive autonomy concerning contraception and fertility choices than less or uneducated women (Basu, 2002). What is more, better educated women are not only more knowledgeable about the available options for limiting fertility, but also better equipped to negotiate these subjects with husbands and extended families (Diamond et al., 1999). As has been pointed out by Martín-García & Baizán (2006), women with a strong or weak orientation towards having a family, adapt their educational choices to suit their future roles in the family formation. However, they have shown that higher educational attainment does not necessarily lead to a postponement of the fertility decisions.

The phenomenon of fertility differences by social/occupational class is widely known. High social status has often been found to be associated with relatively low fertility (e.g. Barthold et al., 2012; Bollen et al., 2007; Fieder & Huber, 2007; Shenk, 2009; Skirbekk, 2008). However, some studies, after taking into account resource availability measured by husbands' income, have argued that the fertility–status relation remained positive (Bereczkei & Csanaky, 1996; Fieder et al., 2005; Hopcroft, 2006; Huber et al., 2010; Tsou et al., 2011; Weeden et al., 2006). The current study found a very significant association between fertility and the social class of the husband or wife, with mean family size increasing by about one child between social classes I and II together and V based on husband's class and by 0.65 based on wife's social class.

Research conducted from a variety of perspectives and on various populations in the 20th century has found that there is a tendency for people to form unions with those from a similar level of educational attainment (Esteve & McCaa, 2008; Katrňák, 2008; Mare, 1991; Schoen & Weinick, 1993; Schwartz & Mare, 2005; Smits et al., 2000). What is more, next to age, education shows the highest degree of assortment (Nielsen & Svarer, 2009). Previous analysis of the National Child Development Study revealed that 59% of marriages involved men and women from the same educational level (Mascie-Taylor, 1987). Educationally homogamous marriages ranging between 42.5–75% were noted in another British study (Gustafsson & Worku, 2005) and in other countries as well (among others by Correia, 2003; Huber & Fieder, 2011; Katrňák et al., 2006; Mare & Schwartz, 2006; Tsou et al., 2011). In the current study there was considerable evidence for resemblance of spouses in terms of educational attainment: 61.6% of the spouses had an identical level of education. In addition, among 38.4% of the educationally heterogamous marriages there was higher female hypogamy (24.3%) than male (14.1%), which was also found in Portuguese (Correia, 2003) as well as by Esteve et al. (2012) in both developed and developing countries (France, Jordan, Mongolia, Slovenia and South Africa).

The tendency for spouses to mate within their own social status is also well documented. However, in most industrialized countries (e.g. US, Hungary) there has been a decline in the importance of social background in marriage choice (Kalmijn, 1991b; Uunk et al., 1996). As has been reported by Kalmijn (1991b), in most countries educational homogamy is quite strong (∼0.55), occupational homogamy is weaker (∼0.40), while the correlation between husbands' and wives' class of origin is the weakest (∼0.30).

Zimmer (1981) investigated the social mobility–fertility hypothesis on a sample of women in Aberdeen, Scotland, and found that there was social homogamy among 47.4% of couples, 36% of wives and 16.6% of husbands were upwardly married. Significant occupational similarity between couples was observed in a Spanish sample by Sánchez-Andrés & Mesa (1994). The findings from this study indicate clear evidence of similarity between mates in social class: ∼39.9% of the spouses were from the same social class, 35.5% and 24.6% of females and males, respectively, were upwardly mobile by marriage, which is consistent with previous studies on the British national cohort (Mascie-Taylor, 1987).

This paper also analysed the differences in educational level between spouses in relation to number of offspring. It appeared that there was very significant heterogeneity in mean fertility between the five educational difference categories, with the highest fertility among the more homogamous marriages and lowest fertility in the more heterogamous marriages, which is in agreement with the previous study on NCDS (Mascie-Taylor, 1986).

We can only speculate on why educational homogamy might increase the number of children. A number of studies show that similarity between partners benefits relationship satisfaction (Lutz-Zois et al., 2006), marital stability (Bereczkei & Csanaky, 1996) and earning (Dribe & Nystedt, 2010), whereas heterogamous couples usually have a higher chance of dissatisfaction or divorce than homogamous ones (Clarkwest, 2007). What is more, positive assortative mating has been shown to reduce stress levels in the partnership (Brynin et al., 2008). On the other hand, it should be noted that among educationally homogamous marriages 41% had no qualifications, whereas only 21% had at least 'O' level. Consequently, less educated and poor spouses invest less in the nurturing and education of each child, tend to marry earlier and have a comparative advantage in numbers arises (Diamond et al., 1999), whereas economically well-being and better educated parents invest more per child.

Strong association between educational assortative mating and the number of offspring was observed by Mare & Schwartz (2006) as well as Tsou et al. (2011). They found that homogamous couples had higher fertility than their heterogamous counterparts. Another study of a contemporary Swedish population confirmed a null or negative relationship between education and average offspring count – low educational attainment of spouses increased mean offspring number (Fieder & Huber, 2007). Contrary to our results, Bereczkei & Csanaky (1996), using a large Hungarian sample, found that women married to equally educated men had a reproductive success close to those married to higher educated husbands. Moreover, Huber & Fieder (2011) did not find any obvious effect of educational homogamy on a woman's average offspring number among US couples. The mean number of children was not significantly different between homogamous and heterogamous couples. However, mean offspring number increased both with decreasing woman's and decreasing husband's educational attainment.

The findings of the relationship between assortative mating for social class and the number of children indicated that increasing heterogeneity was associated with increased fertility. Similar results, whether based on wife's father's and husband's occupation or wife's pre-marital and husband's occupation, were reported by Zimmer (1981). Huber et al. (2010), using the sample of US couples, revealed that the overall income of the married couples as well as wives' income were negatively associated with number of children, whereas the relationship between husbands' income and offspring count was positive.

In this study the relationship between assortative mating and fertility for education and social class appear to be acting in the opposite direction. However, when educational and

social class assortative mating were combined together, educational level was found to be much more important in predicting fertility than social class. Although the research literature seeks to define the causal pathways that link education and fertility, it must be noted that education does not work in isolation to affect fertility – it seems to be a proxy for other factors (Diamond et al., 1999). In general, higher education delays marriage until the degree is completed, increases career aspirations, entry into employment as well as the transfer of knowledge about the costs of children or an increase in social skills enabling better use of health services. Thus, as average aspirations and incomes rise, parents tend to have fewer children. What is more, they are better able to invest in the health and better education of each child (Diamond et al., 1999). It is important to note that a negative relation between female education and fertility is continued even after controlling for income, husband's education and occupation (Basu, 2002).

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

Agrawal A, Heath AC, Grant JD, Pergadia ML, Statham DJ, Bucholz KK, Martin NG, Madden PAF. 2006. Assortative mating for cigarette smoking and for alcohol consumption in female Australian twins and their spouses. Behav Genet 36:553–566.

Barthold JA, Myrskylä M, Jones OR. 2012. Childlessness drives the sex difference in the association between income and reproductive success of modern Europeans. Evol Hum Behav 33:628–638.

Basu AM. 2002. Why does education lead to lower fertility? A critical review of some of the possibilities. World Dev 30:1779–1790.

Beckman L. 1962. Assortative mating in man. Eugenics Rev 54:63–67.

Bereczkei T, Csanaky A. 1996. Mate choice, marital success, and reproduction in a modern society. Ethol Sociobiol 17:17–35.

Blossfeld HP, Timm A, editors. 2003. Who marries whom? Educational systems as marriage markets in modern societies. European studies of population. Dordrecht, The Netherlands: Kluwer Academic Publishers.

Bollen KA, Glanville JL, Stecklov G. 2007. Socio-economic status, permanent income, and fertility: a latent-variable approach. Pop Stud-J Demog 61:15–34.

Brynin M, Longhi S, Pérez ÁM. 2008. The social significance of homogamy. ISER Working Papers 2008-32. Available online at: http://www.iser.essex.ac.uk/publications/working-papers/iser/2008-32.pdf (accessed April 3, 2014).

Clarkwest A. 2007. Spousal dissimilarity, race, and marital dissolution. J Marr Fam 69:639–653.

Correia HR. 2003. Higher male educational hypergamy: evidence from Portugal. J Biosoc Sci 35:303–313.

Diamond I, Newby M, Varle S. 1999. Female education and fertility: examining the links. In: Bledsoe CH, Casterline JB, Johnson-Kuhn JA, Haaga JG, editors. Critical perspectives on schooling and fertility in the developing world. Washington, DC: The National Academies Press. p 23.

Dribe M, Nystedt P. 2010. Educational assortative matching and individual income development: results from longitudinal register data in Sweden 1990–2005. Paper for European Society for Population Economics, Essen, Germany, June 9–12, 2010.

Esteve A, García-Román J, Permanyer I. 2012. The gender-gap reversal in education and its effect on union formation: the end of hypergamy? Popul Dev Rev 38:535–546.

Esteve A, McCaa R. 2008. Assortative mating patterns in the developing world. IUSSP International Seminar on changing transitions to marriage: gender implications for the next generation. Available online at: http://www.hist.umn.edu/~rmccaa/esteve_homogamy_iussp_2008.pdf (accessed April 3, 2014).

Fieder M, Huber S. 2007. The effects of sex and childlessness on the association between status and reproductive output in modern society. Evol Hum Behav 28:392–398.

Fieder M, Huber S, Bookstein F, Iber K, Schäfer K, Winckler G, Wallner B. 2005. Status and reproduction in humans. New evidence for the validity of evolutionary explanations on basis of a university sample. Ethology 111:940–950.

Glicksohn J, Golan H. 2001. Personality, cognitive style and assortative mating. Pers Indiv Differ 30:1199–1209.

Gustafsson S, Worku S. 2005. Assortative mating by education and postponement of couple formation and first birth in Britain and Sweden. Rev Econ Household 3:91–113.

Hopcroft R. 2006. Sex, status, and reproductive success in the contemporary United States. Evol Hum Behav 27:104–120.

Huber S, Bookstein FL, Fieder M. 2010. Socioeconomic status, education, and reproduction in modern women: an evolutionary perspective. Am J Hum Biol 22:578–587.

Huber S, Fieder M. 2011. Educational homogamy lowers the odds of reproductive failure. PLoS ONE 6:e22330.

Hur Y-M. 2003. Assortative mating for personality traits, educational level, religious affiliation, height, weight, and body mass index in parents of a Korean twin sample. Twin Research 6: 467–470.

Kalmijn M. 1991a. Shifting boundaries: trends in religious and educational homogamy. Am Sociol Rev 56:786–800.

Kalmijn M. 1991b. Status homogamy in the United States. Am J Sociol 97:496–523.

Kaplan HS, Lancaster JB, Tucker WT, Anderson KG. 2002. An evolutionary approach to below replacement fertility. Am J Hum Biol 14:1–24.

Katrňák T. 2008. Educational assortative mating in the Czech Republic, Slovakia and Hungary between 1976 and 2003. Sociológia 40: 236–257.

Katrňák T, Kreidl M, Fónadová L. 2006. Trends in educational assortative mating in central Europe: the Czech Republic, Slovakia, Poland, and Hungary, 1988–2000. Eur Sociol Rev 22:309–322.

Keller MC, Thiessen D, Young RK. 1996. Mate assortment in dating and married couples. Pers Indiv Differ 21:217–221.

Kremer M, Chen D. 2002. Income distribution dynamics with endogenous fertility. J Econ Growth 7:227–258.

Lewis SK, Oppenheimer VK. 2000. Educational assortative mating across marriage markets: nonhispanic whites in the United States. Demography 37:29–40.

Lutz-Zois CJ, Bradley AC, Mihalik JL, Moorman-Eavers ER. 2006. Perceived similarity and relationship success among dating couples: an idiographic approach. J Soc Pers Rel 23:865–880.

Mare RD. 1991. Five decades of educational assortative mating. Am Sociol Rev 56:15–32.

Mare RD, Schwartz CR. 2006. Educational assortative mating and the family background of the next generation. Sociol Theor Method 21: 253–278.

Martín-García T, Baizán P. 2006. The impact of the type of education and of educational enrolment on first births. Eur Sociol Rev 22: 259–275.

Mascie-Taylor CGN. 1986. Assortative mating and differential fertility. Biol Soc 3:167–170.

Mascie-Taylor CGN. 1987. Assortative mating in a contemporary British population. Ann Hum Biol 14:59–68.

Morton NE, Chin SC, Ming PM. 1967. Genetics of interracial crosses in Hawaii. Basel: Karger.

Nielsen HS, Svarer M. 2009. Educational homogamy: how much is opportunities? J Hum Resour 44:1066–1086.

Qian Z. 1998. Changes in assortative mating: the impact of age and education, 1970–1990. Demography 35:279–292.

Raymo JM, Xie Y. 2000. Temporal and regional variation in the strength of educational homogamy. Am Sociol Rev 65:773–781.

Rendall MS, Smallwood S. 2003. Higher qualifications, first-birth timings and further childbearing in England and Wales. Population Trends 111:18–26.

Sánchez-Andrés A, Mesa MS. 1994. Assortative mating in a Spanish population: effects of social factors and cohabitation time. J Biosoc Sci 26:441–450.

Schoen R, Weinick RM. 1993. Partner choice in marriages and cohabitations. J Marriage Fam 55:408–414.

Schwartz CR, Mare RD. 2005. Trends in educational assortative marriage from 1940 to 2003. Demography 42:621–646.

Seki M, Ihara Y, Aoki K. 2012. Homogamy and imprinting-like effect on mate choice preference for body height in the current Japanese population. Ann Hum Biol 39:28–35.

Shenk MK. 2009. Testing three evolutionary models of the demographic transition: patterns of fertility and age at marriage in urban South India. Am J Hum Biol 21:501–511.

Skirbekk V. 2008. Fertility trends by social status. Demogr Res 18: 145–180.

Smits J, Lammers J, Ultee W. 2000. More or less educational homogamy? A test of different versions of modernization theory using cross-temporal evidence for 60 countries. Am Sociol Rev 65: 781–788.

Speakman JR, Djafarian K, Stewart J, Jackson DM. 2007. Assortative mating for obesity. Am J Clin Nutr 86:316–323.

Stern C. 1973. Principles of human genetics. San Francisco, CA: Freeman.

Tsou M-W, Liu J-T, Hammitt JK. 2011. Parental age difference, educationally assortative mating and offspring count: evidence from a contemporary population in Taiwan. Biol Lett 7:562–566.

Uunk WJG, Ganzeboom HBG, Róbert P. 1996. Bivariate and multivariate scaled association models: an application to homogamy of social origin and education in Hungary between 1930 and 1979. Qual Quant 30:323–343.

Weeden J, Abrams MJ, Green MC, Sabini J. 2006. Do high-status people really have fewer children? Hum Nature-Int Bios 17:377–392.

Whiting S. 2010. Socio-demographic comparison between those UK families with up to two children and those with three or more. Population Matters. Available online at: http://populationmatters.org/documents/family_sizes.pdf (accessed April 3, 2014).

Woolf CM, Dukepoo FC. 1969. Hopi Indians, inbreeding and albinism. Science 164:30–37.

Zajonc RB, Adelmann PK, Murphy ST, Niendenthal PM. 1987. Convergence in the physical appearance of spouses. Motiv Emotion 11:335–346.

Zietsch BP, Verweij KJH, Heath AC, Martin NG. 2011. Variation in human mate choice: simultaneously investigating heritability, parental influence, sexual imprinting, and assortative mating. Am Nat 177: 605–616.

Zimmer BG. 1981. The impact of social mobility on fertility: a reconsideration. Pop Stud-J Demog 35:120–131.