

Are there gender-specific effects of education on the transition to parenthood? An analysis of Belgian and British panel data

Dieter H. Demey

PPSIS Faculty - Department of Sociology
University of Cambridge
Free School Lane, Cambridge CB2 3RQ
United Kingdom
E-mail: dhd23@cam.ac.uk

Extended abstract submitted to the European Population Conference 2010, Vienna (Austria), 1-4 September, topic "Fertility" (convener: Prof. Gunnar Andersson)

Extended abstract

1. Introduction

Fertility change in the post-war period in most industrialised countries is characterised by a decrease in average family size and a rising incidence of childlessness (quantum fertility) as well as a delay of childbearing (tempo fertility). Women's educational attainment has been found to be strongly related to both the quantum and tempo of childbearing: higher educated women have a lower average family size than low educated women, delay entering motherhood, and have higher rates of childlessness. Previous empirical studies have shown that there is a negative effect of educational attainment and enrolment on the probability of becoming a mother (Martin, 1992; De Wit, 1994; Liefbroer & Corijn, 1999; Upchurch, Lillard & Panis, 2002; Martín-García & Baizán, 2006; Nicoletti & Tanturri, 2008). In apparent contrast, a positive effect of educational attainment on first birth probabilities has been reported in a number of countries, indicating an acceleration of entering motherhood among the higher educated after leaving full-time education (Blossfeld & Huinink, 1991; Lappegård & Rønsen, 2005; Kreyenfeld, 2009). However, it has not been explained why such an effect is observed in some countries but not in others. Furthermore, there has been scant attention for the influence of education on the transition to fatherhood, even though it has been argued that focussing on changes in both women's and men's lives would lead to a better understanding of changes in family formation (*e.g.* Oppenheimer, 1994). The available empirical evidence suggests that there is a negative effect of educational attainment and enrolment on the probability of becoming a father, though these effects appear to be weaker than for women (Kiernan & Diamond, 1983; Kravdal & Rindfuss, 2008; Liefbroer & Corijn, 1999; Marini, 1985; Martin-Garcia, 2009; Winkler-Dworak & Toulemon, 2007). The study by Winkler-Dworak and Toulemon (2007) is the only to have reported a catching-up of first births among higher educated men.

The main aims of this study are to investigate the influence of educational attainment and enrolment on the transition to parenthood, to examine whether there is a catching-up or acceleration effect, to identify gender-specific effects of education on becoming a parent, and to test whether the impact of education on first births differs between Belgium and the United Kingdom. Data from two panel studies have been analysed using methods for longitudinal data analysis: the Panel Study of Belgian Households for Belgium (PSBH) and the British Household Panel Survey for Britain (BHPS). The extended abstract subsequently discusses the theoretical framework and the hypotheses, describes the data and the methods, and reports the results of the preliminary analyses.

2. Theoretical framework

2.1. The effect of educational attainment

Becker (1981) argues that the demand for children depends on the relative cost of children (compared to other commodities) and the total household income. This implies that an increase in the relative price of children will reduce the demand for children. With respect to the effect of income on the demand of children, economic theory specifies two types of effects, namely an income effect and an opportunity cost effect. The *income effect* implies that an increase in income will exert a positive effect on the demand of children, suggesting a positive relation between a family's income and the number of children (Becker, 1969; Berk & Berk, 1983; Pollak & Watkins, 1993). However, parents with a high income might invest more in the quality of their children - such as education, training, food, clothes, *etc.* - which increases the relative price of children and decreases the demand for children (Becker, 1969; 1981; Becker & Lewis, 1973). The *opportunity cost effect* implies that an increase in women's income will have a negative effect on the demand of children, suggesting a negative relation between a woman's income and the number of children. It has been argued that the opportunity cost effect dominates the income effect, leading to a negative effect of women's income on their number of children (Bagozzi & Van Loo, 1978; Mincer, 1963). As far as men are concerned, according to Becker (1981), an increase in men's earning power will not influence the relative cost of children since men's contribution to the bearing and rearing of children is minimal. Thus, a change in the earning power of men will not influence the demand for children. On the contrary, Becker suggests that there might even be a positive effect of men's earnings on the number of children.

The *opportunity cost effect and income effect hypothesis* therefore postulates:

- for women : a negative effect of educational attainment on first births
- for men : a positive effect of educational attainment on first births

Within the framework of role theory, sociologists have argued that the gender-specific division of labour is a central element in the relation between employment and fertility. The starting point is that individuals occupy several social roles in society, and each role brings with it a set of role expectations which prescribe the "*favourable*" actions related to a particular role (Parsons, 1963). It is possible that individuals have to deal with role conflicts, by which is meant "*the exposure [...] to conflicting sets of legitimized role expectations such that complete fulfilment of both is realistically impossible*" (Parsons, 1963). Several sociologists have argued that there is an inter role conflict between the roles of mother and worker due to the gender-specific division a labour (Bernhardt, 1993; Brewster & Rindfuss, 2000; Davis, 1984; Rindfuss & Brewster, 1996; Stycos & Weller, 1967). This is the role incompatibility hypothesis which states that there is an incompatibility between the mother and the worker role and which predicts a negative association between fertility and women's employment. As the expanding opportunities for women in the education system have been a salient factor in stimulating women's labour market participation in the post-war period, the role incompatibility hypothesis predicts – by extension – a negative effect of educational attainment on fertility. In contrast, it is expected that men will not be confronted with an inter role conflict between the roles of father and worker because their main role is that of breadwinner.

The *role incompatibility hypothesis* therefore predicts:

- for women : a negative effect of educational attainment on first births
- for men : no effect of educational attainment on first births

2.2. The effect of educational enrolment

One of the most consistent findings of empirical studies on education and fertility is that not only educational attainment influences fertility, but also the process of obtaining an educational qualification. In particular, the fact of being enrolled in education has repeatedly and consistently been found to delay the entry into parenthood. How can we explain the inhibiting effect of educational enrolment on childbearing? In the discussion on the sociological perspective towards employment and fertility it was argued that it is difficult to combine the roles of a mother and a worker due to the gender-specific division of household labour. The role incompatibility hypothesis predicts that for this reason employed women will restrict their fertility. It has been argued in the literature that female students are confronted with a similar incompatibility between the student and mother role (Blossfeld & Huinink, 1991; Glick, Ruf, White &

Goldscheider, 2006; Kravdal & Rindfuss, 2008; Martín-García, 2008; Martín-García & Baizán, 2006; Thornton, Axinn and Teachman, 1995; Winkler-Dworak & Toulemon, 2007). In addition, there may exist normative expectations in society that young people (*i.e.* both women and men) enrolled in education should not enter marriage or parenthood (Blossfeld & Huinink, 1991; Lappegård & Rønsen, 2005; Thornton, Axinn and Teachman, 1995).

The *student role incompatibility hypothesis* therefore predicts:

- for women : a negative effect of educational enrolment on first births (effect stronger than that for men)
- for men : a negative effect of educational enrolment on first births (effect weaker than that for women)

From an economic perspective it has been argued that the opportunity costs of ending education prematurely as a consequence of having children may be substantial, since a drop out from education may influence future occupations, career and income (Nicoletti & Tanturri, 2008; Oppenheimer, 1988; Thornton, Axinn and Teachman, 1995). In addition, Thornton, Axinn and Teachman (1995) argue that since individuals choose partners with similar characteristics – such as for instance education, political views, lifestyle - quitting education could result in a partner with less education and consequently earning power. Finally, students may simply not be able to afford children, since they will be financially dependent on their parents (Blossfeld & Huinink 1991; Lappegård & Rønsen, 2005); Martín-García & Baizán, 2006; Thornton, Axinn and Teachman, 1995; Winkler-Dworak & Toulemon, 2007) and money earned during vacations or during the school year will probably be used to cover study-related expenses.

As these factors are assumed to be equally important for women and men, the *opportunity cost hypothesis* posits:

- for both women and men: a negative effect of educational enrolment on first births

2.3. The catching-up or acceleration effect

The role incompatibility hypothesis as well as the opportunity cost effect and income effect hypothesis predict a negative effect of women's educational attainment on first birth rates. However, a number of studies have reported a positive effect of female educational attainment on the transition to motherhood. This positive effect might in fact be produced by two separate effects and it is important to make a clear distinction between the two. The first effect would indicate that higher educated women have higher first birth rates than lower educated women. However, this would contradict the predictions based on sociological and economic theories as well as previous descriptive empirical findings which show that higher educated women have a lower average family size than low educated women, delay entering motherhood, and have higher rates of childlessness. The second is a *catching-up or acceleration effect* and means that the higher educated enter motherhood sooner after leaving education than the lower educated. It has been argued that after leaving education higher educated women are confronted with a certain pressure exerted by normative and biological factors – a pressure which increases with age – leading higher educated women to accelerate the entry into motherhood relative to lower educated women (Blossfeld & Huinink, 1991; Lappegård & Rønsen, 2005). Unfortunately, to our knowledge, it has not been examined yet whether higher educated men accelerate the transition to fatherhood and it is therefore unclear which could be the reasons for expecting a similar effect among men.

The *catching-up or acceleration effect hypothesis* predicts:

- for women: an acceleration of entering motherhood among the higher educated after leaving full-time education
- for men: both acceleration and deceleration effects are possible

3. Description of the data and methods

Data from two panel studies have been used to investigate the effect of education on the transition to parenthood: the British Household Panel Survey (BHPS) for the United Kingdom (see Taylor, Brice, Buck & Prentice-Lane, 2009) and the Panel Study of Belgian Households (PSBH) for Belgium (see Jacobs,

Loots, Marynissen & Scheipers, 1991). The BHPS is an ongoing study and organised the first data collection wave in 1991. In this first wave, over 5500 households were interviewed, covering more than 13000 persons. For the current study, data from the first 15 waves have been used (1991-2005). The PSBH started in 1992 and the last wave was in 2002, thus a total of 11 waves are available. In the first wave, around 4500 households were interviewed, covering more than 11000 individuals. Here, data from all waves have been used. Retrospective and prospective data have been combined to reconstruct first birth histories up to the date of the last interview. The main independent variables are educational attainment and educational enrolment. The indicator for educational attainment is time-constant and has five categories: (1) enrolled in education at the time of the last interview; (2) lower secondary education or below; (3) upper secondary education; (4) non-university higher education; (5) university higher education. The indicator for educational enrolment is time-varying and also has five categories: (1) enrolled in education; (2) between 0 to 4 years after leaving education; (3) between 5 to 8 years after leaving education; (4) between 9 to 12 years after leaving education; (5) more than 12 years after leaving education. Finally, several control variables referring to a person's partnership status, family background, religion, place of birth and birth cohort have been included in the analysis. For Belgium, the sample consists of 3742 women and 3656 men (2489 and 2160 first births respectively), and for the United Kingdom the sample consists of 4847 women and 4517 men (3242 and 2524 first births respectively).

A discrete-time complementary log-log hazard model has been used to examine the effect of education on the transition to parenthood. The discrete-time hazard model is written as follows:

$$\text{clog-log } h(t_{ij}) = [\alpha_1 D_{1ij} + \alpha_2 D_{2ij} + \dots + \alpha_j D_{jij}] + [\beta_1 X_{1i} + \beta_2 X_{2ij}]$$

where $h(t_{ij})$ is the discrete-time hazard function of experiencing a first live birth for individual i in time period j conditional upon not having experienced a first live birth before j ; $[\alpha_1 D_{1ij} + \alpha_2 D_{2ij} + \dots + \alpha_j D_{jij}]$ represents the baseline hazard function; $\beta_1 X_{1i}$ is a time-invariant predictor and $\beta_2 X_{2ij}$ is a time-variant predictor (Singer & Willett, 2003).

4. Preliminary results

The main aims of the analyses are to investigate the effect of educational attainment and enrolment on the transition to parenthood, to examine whether there is a catching-up or acceleration effect, to identify gender-specific effects of education on becoming a parent, and to test whether the impact of education on first births differs between Belgium and the United Kingdom. In a preliminary analysis, three models have been estimated: model one only includes educational attainment; model two contains educational attainment and enrolment; and model three adds to model two an interaction effect between educational attainment and the time elapsed since leaving full-time education. Each of these models has been estimated separately by gender and by country, thus 12 models have been estimated in total. The fitted first birth hazard has been visualised to facilitate the interpretation of the results of the analyses and makes informal comparisons across different models possible. In order to formally test whether the impact of education on the transition to parenthood differs between the genders and countries, two strategies have been adopted: the first method pools the two samples and creates interaction terms between on the one hand education and on the other hand an indicator for gender or the country. The second method tests whether the difference between the parameter estimates is statistically significant by using the following formula: $z = (b_1 - b_2) / [s^2(b_1) + s^2(b_2)]^{1/2}$ (Liefbroer & Corijn, 1999).

The results for model one indicate that for both women and men as well as in both Belgium and Britain educational attainment exerts a negative effect on the first birth hazard (all $p < 0.01$). Furthermore, women and men who were still enrolled in full-time education at the time of the last interview were the least likely to enter parenthood. The second model adds the effect of educational enrolment to model one and the results show that for women and men in both countries – as expected – being enrolled in education strongly reduces the probability of experiencing a first birth. Controlling for educational enrolment weakens the negative effect of educational attainment among Belgian and British women as well as among British men, whereas for Belgian men the effect of educational attainment becomes positive and significant. Finally, the results for model three show that the entry into parenthood among women and men with a university degree appears to be accelerated in Belgium but decelerated in Britain.

References

- Bagozzi, R. P., & Van Loo, M. F. (1988). An Investigation of the Relationship Between Work and Family Size Decisions over Time. *Multivariate Behavioral Research*, Vol. 23, pp. 3-34.
- Becker, G. S. (1969). An economic analysis of fertility. In National Bureau Committee of Economic Research. Special conference series 11 (Ed.), "Demographic and economic change in developed countries: A conference of the Universities-National Bureau Committee for Economic Research" (pp. 209-231). Princeton: Princeton University Press.
- Becker, G. S. (1981). *A Treatise on the Family*. Cambridge (Massachusetts): Harvard University Press.
- Becker, G. S., & Lewis, H. G. (1973). On the Interaction between the Quantity and Quality of Children. *Journal of Political Economy*, Vol. 81, S279-S288.
- Berk, R. A., & Berk, S. F. (1983). Supply-Side Sociology of the Family: The Challenge of the New Home Economics. *Annual Review of Sociology*, Vol. 9, pp. 375-395.
- Bernhardt, E. M. (1993). Fertility and Employment. *European Sociological Review*, Vol. 9 (No 1), pp. 25-42.
- Blossfeld, H.-P., & Huinink, J. (1991). Human Capital Investments or Norms of Role Transition? How Women's Schooling and Career Affect the Process of Family Formation. *American Journal of Sociology*, Vol. 97 (No 1), pp. 143-168.
- Brewster, K. L., & Rindfuss, R. R. (2000). Fertility and Women's Employment in Industrialized Nations. *Annual Review of Sociology*, Vol. 26, pp. 271-296.
- Davis, K. (1984). Wives and Work: The Sex Role Revolution and Its Consequences. *Population and Development Review*, Vol. 10 (No 3), pp. 397-417.
- De Wit, M. L. (1994). Educational Attainment and Timing of Childbearing among Recent Cohorts of Canadian Women: A Further Examination of the Relationship. *Canadian Journal of Sociology / Cahiers canadiens de sociologie*, Vol. 19 (No 4), pp. 499-512.
- Glick, J. E., Ruf, S. D., White, M. J., & Goldscheider, F. (2006). Educational Engagement and Early Family Formation: Differences by Ethnicity and Generation. *Social Forces*, Vol. 84 (No 3), pp. 1391-1415.
- Jacobs, T., Loots, I., Marynissen, R., & Scheipers, T. (1991). *Panel Studie van Belgische Huishoudens. Onderzoeksplan*. Antwerpen: Universiteit Antwerpen, Steunpunt Gezinsdemografisch Panel.
- Kiernan, K. E., & Diamond, I. (1983). *The Age at which Childbearing Starts--A Longitudinal Study*. *Population Studies*, Vol. 37 (No 3), pp. 363-380.
- Kravdal, Ø., & Rindfuss, R. R. (2008). Changing Relationships between Education and Fertility: A Study of Women and Men Born 1940 to 1964. *American Sociological Review*, Vol. 73 (No 5), pp. 854-873.
- Kreyenfeld, M. (2009). Uncertainties in Female Employment Careers and the Postponement of Parenthood in Germany. *European Sociological Review*, Advance Access (published May 4, 2009).
- Lappegård, T., & Rønsen, M. (2005). The Multifaceted Impact of Education on Entry into Motherhood. *European Journal of Population*, Vol. 21 (No 1), pp. 31-49.
- Liefbroer, A. C., & Corijn, M. (1999). Who, What, Where, and When? Specifying the Impact of Educational Attainment and Labour Force Participation on Family Formation. *European Journal of Population*, Vol. 15 (No 1), pp. 45-75.

- Marini, M. M. (1985). Determinants of the Timing of Adult Role Entry. *Social Science Research*, Vol. 14 (No 4), pp. 309-350.
- Martin, T. C. (1992). Delayed Childbearing in Contemporary Spain. *European Journal of Population*, Vol. 8 (No 3), pp. 217-246.
- Martín-García, T. (2009). Bring Men Back In': A Re-examination of the Impact of Type of Education and Educational Enrolment on First Births in Spain. *European Sociological Review*, Vol. 25 (No 2), pp. 199-213.
- Martín-García, T., & Baizán, P. (2006). The Impact of the Type of Education and of Educational Enrolment on First Births. *European Sociological Review*, Vol. 22 (No 3), pp. 259-275.
- Mincer, J. (1963). Market Prices, Opportunity Costs and Income Effects. In "Measurement in Economics: Studies in Mathematical Economic and Econometrics in Memory of Yehuda Grunfeld". Stanford
- Nicoletti, C., & Tanturri, M. L. (2008). Differences in Delaying Motherhood across European Countries: Empirical Evidence from the ECHP. *European Journal of Population*, Vol. 24 (No 2), pp. 157-183.
- Oppenheimer, V. K. (1988). A Theory of Marriage Timing. *The American Journal of Sociology*, Vol. 94 (No 3), pp. 563-591.
- Oppenheimer, V. K. (1994). Women's rising employment and the future of the family in industrial societies. *Population and development Review*, Vol. 20 (No 2), pp. 293-342.
- Parsons, T. (1963). *The social System*. Glencoe: The Free Press.
- Pollak, R. A., & Watkins, S. C. (1993). Cultural and Economic Approaches to Fertility: Proper Marriage or Mesalliance? *Population and Development Review*, Vol. 19 (No 3), pp. 467-496.
- Rindfuss, R. R., & Brewster, K. L. (1996). Childrearing and Fertility. *Population and Development Review*, Vol. 22 (suppl.), pp. 258-289.
- Singer, J. D., & Willett, J. B. (2003). *Applied Longitudinal Data Analysis. Modelling Change and Event Occurrence*. Oxford University Press.
- Stycos, J. M., & Weller, R. H. (1967). Female Working Roles and Fertility. *Demography*, Vol. 4 (No 1), pp. 210-217.
- Taylor, M. F., Brice, J., Buck, N., & Prentice-Lane, E. (2009). *British Household Panel Survey User Manual Volume A: Introduction, Technical Report and Appendices*. Colchester: University of Essex.
- Thornton, A., Axinn, W. G., Teachman, J. D. (1995). The Influence of School Enrollment and Accumulation on Cohabitation and Marriage in Early Adulthood. *American Sociological Review*, Vol. 60 (No 5), pp. 762-774.
- University of Essex. Institute for Social and Economic Research. (June 2007). *British Household Panel Survey: Waves 1-15, 1991-2006 [computer file]. 3rd Edition. (SN: 5151)*. Colchester, Essex: UK Data Archive [distributor].
- Upchurch, D. M., Lillard, L. A., Panis, W. A. (2002). Nonmarital Childbearing: Influences of Education, Marriage, and Fertility. *Demography*, Vol. 39 (No 2), pp. 311-329.
- Winkler-Dworak, M., & Toulemon, L. (2007). Gender Differences in the Transition to Adulthood in France: Is There Convergence Over the Recent Period? *European Journal of Population*, Vol. 23 (No 3-4), pp. 273-314.