Couples' childlessness and parenthood as a result of male and female socioeconomic status. Bayesian analysis in case of selected European countries.

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Extended abstract

The connection between socioeconomic status and procreative behavior among contemporary populations strongly attracts research interests of scientists and still remains a controversial topic. In order to explain procreative behaviors by socioeconomic features, different populations living in different conditions were investigated. These studies provide new knowledge and at the same time reveal new areas of research problems and relationships. In historical societies and in small-scale contemporary populations a positive association between socioeconomic status (measured mainly by educational level and income) and the number of children was revealed (Cronk 1991, Gurven and von Rueden 2006, Skirbekk 2008, von Rueden et al. 2011). However, in modern, highly developed societies this association is subject to changes. It seems to be equivocal, especially when analyses are stratified by sex. It was noted that among women correlation between the socioeconomic status and the number of children is clearly negative (Weeden et al. 2006, Fieder and Huber 2007, Nettle and Pollet 2008), while among men remains positive (Fieder et al. 2005, Weeden et al. 2006, Nettle and Pollet 2008). It was suggested that these differences are caused by socioeconomic sex-specific association. Subpopulation of childless men with low socioeconomic status have a high risk of childlessness (while women with low status have a low risk) and excluding them from the analyses led to the same results as among women (Fieder and Huber 2007, Barthold et al. 2012).

Particularly important issue of modern reproductive behaviors in highly developed societies is the problem of childlessness. The reason of starting a union of man and woman is no longer just procreation, but joint implementation of other life goals. These other objectives may lead to postponement of parenthood or even conscious decision to stay childless. It should be noted that the procreative behaviors among couples without children have different nature than in population of parents. In the first case it is the switch to the parenthood (being a

mother or a father is an entirely new experience), and in the second it is enlargement of the existing family (a couple have already parental experience).

The impact of socioeconomic status on fertility is analyzed mostly among women or both men and women treated as two separate populations. The procreative behaviors among couples with regard to male and female socioeconomic features still remains an understudied topic. This "couples" approach seems to be important due to the fact that in modern societies fertility decisions are not taken solely by men or solely by women, but they are the result of mutual preferences and compromises between both of potential parents (taking into account the individual opportunity costs of both sides). Therefore, the aim of this study is to investigate couples' procreative behaviors among contemporary European populations with regard to socioeconomic features of each partner, and consequently to determine whose socioeconomic characteristics (male or female) has a stronger impact on fertility behavior in a relationship. To clarify, the interest of the study is to determine the influence of social and economic variables describing the status of a woman and a man separately (such as education, income, activity status) on the mutual couples' reproductive behavior (number of children). Socioeconomic characteristics of a couple and household, e.g. living floor space, ownership flat/house status, household income, cost of childcare were included as a control variables. Additionally, to simulate the reproductive behavior according to levels of adopted characteristics, several couple's profiles will be presented. The data coming from the first wave of *Generations and Gender Survey* for selected European countries were used.

Based on the previous researches on the impact of socioeconomic conditions on fertility, the following hypotheses are formulated: (1) a couple's procreative behaviors depend on the socioeconomic status of both a woman and a man, (2) fertility of a couple is stronger influenced by characteristics of partner with higher socioeconomic status, (3) among childless couples the relation between socioeconomic status and fertility is different than among parents.

To verify these hypotheses Zero-Inflated Poisson (ZIP) model will be used [see Lambert 1992, Marzec and Osiewalski 2012]. The model is based on standard Poisson regression model but with different component for zeros. It is important that the specification of model allows treating childlessness as a qualitatively different state than having children. It means that the ZIP model gives the opportunity to set up other determinants in modeling zero children and other in analyzing parenthood. Such properties of the model are particularly important when the objective of analysis is to combine both childlessness and parenthood, but with the possibility to take into account the different conditions of the two states.

The formula for the ZIP model, assuming n independent variables Y_i (i = 1, 2, …, n) can be represented as follows:

$$P(Y_i = y_i) = \begin{cases} p_i, & y_i = 0 \\ \dfrac{1-p_i}{1-\exp(-\lambda_i)} \exp(-\lambda_i) \dfrac{\lambda_i^{yi}}{y_i!}, & y_i = 1,2,..., \quad p_i \in [0,1]. \end{cases}$$

The regressions for zero and count states are included in the following form:

$$p_i = \frac{\exp(x_i \gamma)}{1+\exp(x_i \gamma)}, \; \lambda_i = \exp(w_i \delta), \;\; i = 1,..., n,$$

where x_i and w_i are vectors of covariates and γ and δ are vectors of parameters. The coefficients estimated in the zero state are interpreted as in a logistic regression, while the coefficients for the count state have the same interpretation as in a standard Poisson regression.

In order to make formal inference about uncertainty of covariates and nonlinear function of the model parameters (such as probability of childlessness or expected number of children) as well as to incorporate our prior knowledge Bayesian approach will be applied. Thus it will be possible to determine the distribution of the posterior expected number of children for chosen couple's socioeconomic profile.

The preliminary results provided for Austria, Bulgaria and France are shown in the table 1. The analysis confirmed that the couple's family model is driven by gender specific socioeconomic features. The strength of that influence varies across countries. In France, where traditional gender role (man as a head of the family) is popular, it occurred that male socioeconomic features determine the couple's reproductive behavior much stronger than in other countries. Among all analyzed countries activity status of a woman occurred to be much more important than man's activity status. In particular, being a housewife strongly increase the average number of children in Austria and France. However, the interesting results was provided for Bulgaria – it was revealed that being a housewife in that country is not significant for the family model and it does not lead to higher average number of children. Additionally, when among all other countries higher woman's income leads to the lower number of children, in Bulgaria the connection is opposite – female income has positive influence on the average number of children. It suggests that in Bulgaria working man is not able to maintain a family without the financial support from his wife/cohabitee. Further

analysis will be done to explore revealed connections from various perspectives (e.g. checking the causality between variables) and to understand better the compromise concerning couple's family model due to male and female socioeconomic status.

Table 1. The *a posteriori* expected values of parameters within zero and count state regressions. Model run on the dataset for Austria (2623 couples), Bulgaria (5416) and France (4136).

Variable	CHILDLESSNESS			PARENTHOOD		
	Austria	Bulgaria	France	Austria	Bulgaria	France
Female:						
Education	0.257***	0.169**	0.025	-0.077***	-0.129***	-0.010
Income	0.538***	0.159**	0.110**	-0.081***	0.037**	-0.529***
Unemployed	0.135	-0.709***	-0.377+	-0.051	0.173***	0.004
Housewife	-2.910***	-1.718***	-1.678***	0.169***	0.084	0.221***
Male:						
Education	0.234**	-0.087	0.101**	-0.068***	-0.042**	-0.021**
Income	-0.099	-0.014	-0.160***	-0.038*	-0.007	0.021*
Unemployed	0.095	-0.315	-0.038	0.119	0.162***	0.012
Homemaker	-0.866	-0.054	-0.917	0.127	0.047	0.125

Note: Control variables: a) socioeconomic characteristics: type of settlement, living floor space, ownership status, pooling the money, saving the money, second car, second home, hh total income; b) other – marital status, age of woman, age of man, type of job contract, stability of the relationship; c) defined only for parenthood: institutional help for child care, friends'/relatives' help for child care, cost of child care.

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