Family and Socioeconomic Predictors of Childlessness for Women in High Income Countries: a multilevel analysis

Susan Schaffnit and Rebecca Sear, London School of Hygiene and Tropical Medicine

Objective:

This research aims to unravel the effects of living with kin on childlessness for women in high income countries. Particular attention will be paid to how socioeconomic position (SEP) may modify the effects of kin on childlessness, by considering interactions between SEP indicators and kin variables and their associations with the probability of remaining childless.

Background:

Kin (or women's families) are known to influence women's fertility outcomes throughout the world (birth timings, child survival and health, total completed fertility, etc)(reviewed [4]). Proximity to kin may allow women to increase their fertility by easing the costs of reproduction (though childcare, emotional support, financial transfers) or through social pressure[5–8]. Sometimes, however, the relationship between kin proximity and fertility may be negative, particularly in resource stressed environments, possibly because of resource competition between kin[9,10].

Studies of childlessness have shown strong correlations between childlessness and socioeconomic status indicators. While income and often education are negatively related to childlessness for men[1,2], these two measures of socioeconomic position have been shown to have opposite effects on women's childlessness. Education is associated with higher rates of childlessness for women[3]. This may either be due to postponement of childbearing beyond biologically viable years, or due to a conscious choice to pursue status or career goals over childbearing. Wealth, on the other hand, is more complex for women. While women's own wealth positively relates to childlessness[2] (perhaps because of reverse causation: having children reduces women's earning potential), wealth of women's partners has been shown to negatively associate with childlessness[3].

We are interested in how proximity to kin, measured by how long women live with their parents, interacts with SEP to affect fertility outcomes, here childlessness and its inverse, age at first birth. Living with one's parents, while measuring proximity to kin (and potential, though not guaranteed, support), also may also indicate economic hardship (real or perceived)[11,12]. Qualitative evidence from contemporary Italy - a country with high rates of adult 'children' living with parents - shows that individuals often choose to live with their parents until they have enough resources to move out. Having enough resources often requires (or is *perceived* to require) completing one's education and establishing one's self in a career[11]. Family formation then begins when one has acquired sufficient resources and moved from their parents' home. This process requires a significant delay in reproduction which is highly correlated with childlessness[13], whether through conscious or coincidental means. By including SEP in our models, with measures of wealth, education, and social mobility, we hope to get at the association between kin proximity and childlessness *and* potential differences by SEP.

This research will test three hypotheses based on the literature briefly discussed above:

1. Co-residence with kin for longer periods of time will increase the probability of childlessness. Women will delay first births due to co-residence and thus be more likely to remain childless.

2. Education & Wealth will have delaying effects on women's first births and thus positively relate to childlessness
3. Wealth will modify the effects of co-residence with parents

Methods:

Data from the Generations and Gender Survey[14] were used to test these hypotheses. These data include information for over 24,000 women (aged 18-78) from 8 high-income countries: Lithuania, Belgium, Norway, Romania, France, Georgia, Russia, and Bulgaria. We analysed the data using two regression based methods. First, we used multilevel logistic regression to determine the probability of remaining childless for women over age 45, where women were nested within countries. We included predictors for wealth at time of interview (a score created with factor analysis by country), country level wealth (a score created by averaging women's total sample relative wealth), highest education achieved, a partnership variable, age at which women moved from their parents' home, and the respondent's number of siblings. We also included categorical variables for the ages at which women's mothers and fathers died. Finally, a measure of social mobility was used to try to account for the fact that wealth at time of interview may not be indicative of wealth at all time points in women's life. This variable was created by calculating the difference in women's and father's standard deviations from cohort means for education (as information about family wealth is unavailable and wealth and education correlate). Positive values indicate that women's own educational is higher in relation to her cohort peers than her father's education level was to his cohort peers (interpreted as upward social mobility). Interactions between SEP variables and kin variables (parents alive, lives with parents) were also tested.

Secondly, we used multilevel discrete time event history analysis to consider the determinants of women's progression to first birth, which inversely represents a measure of reproductive delay. We used time-varying predictors of partner status, whether a woman's parents are alive, and if she lives with her parents in given time periods. Highest level of completed education, wealth at time of interview, country wealth, number of siblings, and social mobility (as described above) were also included the model as time-constant predictors. In addition to a main effects model, a model was run with interactions between SEP and kin variables.

Results:

Of the 12,864 women in the data subsample who were over the age of 45 at the time of interview, 1,430 were childless (approximately 11.2%). In the total sample (n=23,661) the median ages of leaving the parental home and first birth were 20 and 24 respectively. Table 1 shows the coefficients and odds ratios for the SES and kin variables from the logistic regression on childlessness at age 45 with no interaction terms. Wealth and education have opposite associations with childlessness. While wealth decreases the probability of remaining childless, higher levels of education increase the probability of childlessness. Living with parents at later ages significantly and positively relates to childlessness, though the effect size is not large. Main effects for the first birth event history analysis are also shown in Table 1. Higher levels of all SES variables are associated with later first births, as is co-residence with parents. Women whose mothers are dead have earlier first births, though there is no relationship between the survival status of the father and first birth.

Table 1: Odds ratios[+] and confidence intervals for main SES and kin effects of logistic regression of childlessness after age 45 and discrete time event history analysis for first birth

	Childless at age 45				First Birth			
			95% confidence				95% confidence	
Variable	OR			interval	OR			interval
Socioeconomic Status								
Wealth	0.65	**	0.56	0.79	0.54	**	0.50	0.58
Country Wealth	4.77	**	2.79	11.35	0.45	**	0.37	0.56
ref: No Education/Primary	1.00				1.00			
Secondary Education	1.36	*	1.10	1.75	0.94	*	0.88	1.00
Post-Secondary/Tertiary	2.41	**	1.90	3.12	0.68	**	0.64	0.74
Social Mobility	0.94	*	0.88	1.00	0.98	*	0.97	1.00
Kin								
Age ended co-residence	1.04	**	1.03	1.05				
ref: not living with parents					1.00			
living with parents					0.12	**	0.10	0.14
ref: Mother Died <= age 10	1.00							
11-20.	1.25		0.71	2.15				
21-25	0.77		0.42	1.38				
26-30	0.87		0.50	1.47				
31-35	0.81		0.46	1.32				
36-40	0.95		0.56	1.48				
41-45	0.81		0.49	1.24				
>45 or Mother Alive	0.79		0.49	1.16				
ref: Mother Dead					1.00			
Mother Alive					1.15	**	1.07	1.24
ref: Father Died <= age 10	1.00							
11-20.	1.41		0.87	2.25				
21-25	1.34		0.83	2.24				
26-30	1.17		0.73	1.84				
31-35	1.03		0.66	1.63				
36-40	1.22		0.79	1.92				
41-45	0.96		0.62	1.47				
>45 or Father Alive	1.10		0.74	1.65				
ref: Father Dead					1.00			
Father Alive					1.02		0.97	1.06

*p<0.05; **p<0.001

[+]values over one represent increased probabilities of the outcome while values under one represent decreased probability of the outcome compared to the reference category

The same models were run with interactions between wealth and co-residence with parents. For childlessness, living with one's parents later increased the probability of remaining childless over time for all women, but the effect is more strongly felt by women with low wealth scores (Figure 1). The same interaction was found to be significant in the first birth analyses (Figure 2). In this case, it appears that while later co-residence relates to delays in first births for everyone, the effect is more strongly felt by low-wealth women who, by age 35, are more likely to be childless, than high-wealth women who also extended co-residence with their parents.

Results mostly support our hypotheses, with the exception of those related to household wealth. Wealth negatively relates to childlessness, but simultaneously predicts later first births. This

may be because women postpone births in order to acquire resources, but when they chose to reproduce their wealth allows them to do so successfully.

Figure 1: Predicted probabilities of remaining childless at age 45 - interactions between wealth and age at which one leaves the parental home. All other variables are held at their mean.
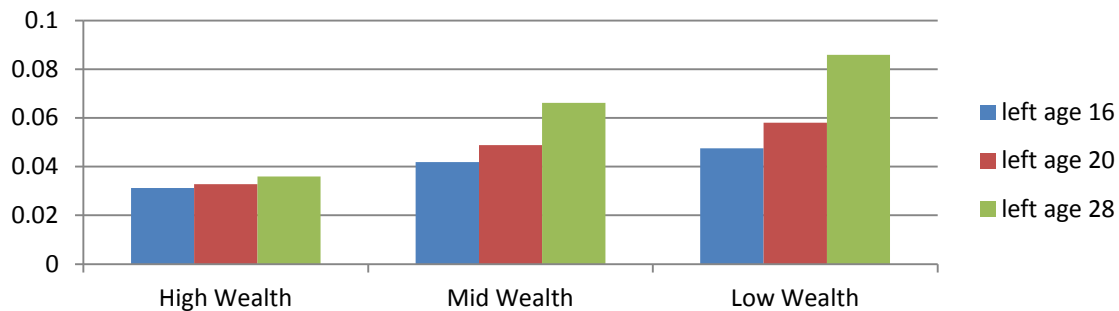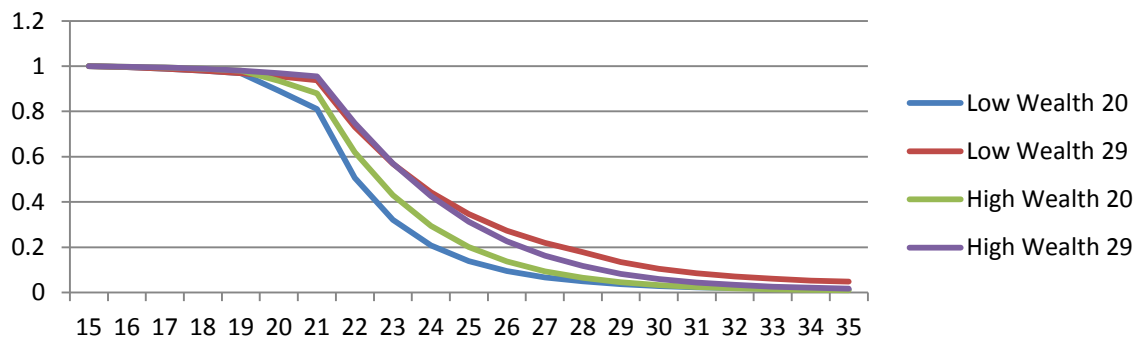

Figure 2: Predicted survival curve for progression to first birth showing the interaction between wealth and co-residence with parents. It is assumed that women gain a partner at age 22 and both parents are alive at all time points. All other variables are held at their mean.

References:

1. Fieder M, Huber S, Bookstein FL. Socioeconomic status, marital status and childlessness in men and women: an analysis of census data from six countries. *Journal of Biosocial Science*. 2011;43(5):619–635. Available at: http://www.ncbi.nlm.nih.gov/pubmed/21729363.

2. Weeden J, Abrams MJ, Green MC, Sabini J. Do high-status people really have fewer children? *Human Nature*. 2006;17(4):377–392. Available at: http://www.springerlink.com/index/10.1007/s12110-006-1001-3.

3. Huber S, Bookstein FL, Fieder M. Socioeconomic Status, Education, and Reproduction in Modern Women: An Evolutionary Perspective. *American Journal of Human Biology*. 2010;22(5):578–587. Available at: http://www.ncbi.nlm.nih.gov/pubmed/20737603. Accessed April 5, 2012.

4. Sear R, Coall D. How much does family matter? Cooperative breeding and the demographic transition. *Population and Development Review*. 2011;37(Suppl 1):81–112. Available at: http://www.ncbi.nlm.nih.gov/pubmed/21280366.

5. Kaptijn R, Thomese F, van Tilburg TG, Liefbroer AC. How Grandparents Matter Support for the Cooperative Breeding Hypothesis in a Contemporary Dutch Population. *Human Nature-an Interdisciplinary Biosocial Perspective*. 2010;21(4):393–405. Available at: <Go to ISI>://000284903500003. Accessed April 5, 2012.

6. Waynforth D. Grandparental investment and reproductive decisions in the longitudinal 1970 British cohort study. *Proceedings of the Royal Society B: Biological Sciences*. 2011. Available at: http://rspb.royalsocietypublishing.org/content/early/2011/09/09/rspb.2011.1424.abstract.

7. Mathews P, Sear R. Family and fertility: kin influence on the progression to a second birth in the British Household Panel Study. *Unpublished Manuscript*. 2010.

8. Mathews P, Sear R. Does the kin orientation of a British female's social network influence her entry into motherhood? *Unpublished Manuscript*. 2010.

9. Mulder MB. Hamilton's rule and kin competition: the Kipsigis case. *Evolution and Human Behavior*. 2007;28(5):299–312. Available at: <Go to ISI>://000249287000001.

10. Strassmann BI. Cooperation and competition in a cliff-dwelling people. *Proceedings of the National Academy of Sciences of the United States of America*. 2011;108:10894–10901. Available at: <Go to ISI>://WOS:000292137100015.

11. Bernardi L, Oppo A. Fertility and Family Configurations in Sardinia. 2007:1–24.

12. Dykstra P, Komter A. Generational interdependencies in families. *Demographic Research*. 2012:487–506. Available at: http://www.demographic-research.org/Volumes/Vol27/18/default.htm. Accessed October 15, 2012.

13. Liu J, Lummaa V. Age at first reproduction and probability of reproductive failure in women. *Evolution and Human Behavior*. 2011;32(6):433–443. Available at: http://linkinghub.elsevier.com/retrieve/pii/S1090513810001418.

14. United Nations. Generations and Gender Programme: Survey Instruments. 2005.