

# **Inequality in the Distribution of Fertility among Women and Men: Stability and Change Over Time in the UK**

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## **Introduction**

While fertility levels in many European countries have declined, UK fertility rates have remained moderately high overall (Sigle-Rushton, 2009), but also to a greater extent polarised by social class relative to many other European countries (e.g. Ekert-Jaffé et al., 2002). In the UK, the proportion of adults who do not have children is largest among the most highly educated, and those who do are less likely to have large families (Berrington, Stone, & Beaujouan, 2015; Kneale & Joshi, 2008; Rendall & Smallwood, 2003; Sigle-Rushton, 2008). As evidence suggests these inequalities have been increasing over time in the UK (Berrington et al., 2015; Sigle-Rushton, 2008), a question arises then of whether people with lower levels of qualification have made up for the shortfall amongst the most highly educated.

Complicating the interpretation of this existing evidence is that while evidence suggesting that social differentiation of fertility among women has increased in the UK over time is based primarily on micro-analyses, one of the few studies to investigate inequality in the distribution of fertility at the macro level (Shkolnikov, Andreev, Houle, & Vaupel, 2007) showed limited increase in the concentration of fertility in the UK over cohorts entering reproductive age after the end of the Second World War. Instead, based on their evidence, the period may be characterised by its relative stability compared with the more substantial change over previous cohorts. Conceptually, both the concentration and the social polarisation of fertility are related through the disproportionate number of highly educated people who do not become parents, the relative stability in concentration is therefore difficult to reconcile with the increase in the social polarisation of fertility over time. Thus, to better understand the processes of fertility change in a period of educational change it is necessary to show whether the educational differences observed in individual-level associations are reflected in the macro-level concentration of fertility.

Attending to the distribution of fertility, as well as the more often studied level of fertility, is of demographic concern because it highlights how the costs associated with reproducing society are (unevenly) distributed across the population. If childbearing is disproportionately concentrated among a potentially less resourced group of parents with lower levels of education, this raises questions both regarding the equity of the distribution of the costs involved in reproducing the next generation, as well as the impact it might have on children's life chances and poverty. Demographic research on fertility has primarily focused on data on women, excluding men either due to lack of data or concerns about the reliability of men's retrospective fertility histories relating to under-reporting of children fathered in previous relationships (Rendall, Clarke, Peters, Ranjit, & Verropoulou, 1999). The near exclusive focus on women's fertility patterns may seem justified as the indirect cost of foregone earnings tend to be borne by mothers while men's careers and earning tend to be boosted by presence of children. However, since fathers tend to be the main providers in families with children, evidence of polarisation of fertility among men would further reinforce concerns regarding the possible link between an uneven distribution of fertility and children's life chances. Social inequality is high in the UK and child poverty is an ongoing policy concern which successive governments have expressed interest in addressing. The paper asks how the distribution

of reproduction has changed, overall and across educational groups, among both women and men since the Second World War.

## Data

The analysis draws on retrospective fertility histories from three UK surveys to compare cohorts of women and men born between 1935 and 1970. The surveys used are the English Longitudinal Study of Ageing (ELSA) and two UK birth cohort studies, the National Child Development Study (born 1958) and the British Cohort Study (born 1970). Due to the smaller sample size of ELSA, 10-year bands are used to construct cohorts based on birth years. Estimates from these datasets of the proportion of women who have had at least one birth by age 42 are very similar to official statistics based on birth registration data reported by the Office for National Statistics (ONS) for women's cumulative fertility at age 42, although average family size by age 42 is somewhat underestimated in the survey data. However, the level of parental education and the number of prior children fathered is not collected at the registration of births so survey data is required for analysis of the polarisation of fertility by education, and for any analysis of trends in cohort fertility among men.

*Measures and methods:* To describe the concentration of fertility, we use the concentration ratio (CR; or Gini coefficient), the proportion of adults in a cohort who have half the children born to that cohort (the 'Have-half') and the proportion of children in a cohort born to half of the adults in that cohort (the 'Half-have'). The CR ranges from a value of 0, in the case of complete equality where every individual has the same number of children, to 1, in the theoretical case of complete inequality where all the cohort's children were born to one individual. Thus, a high concentration of fertility, high half-have and low have-half proportions, suggest that the number of children born to a cohort are unevenly distributed across the adults of that cohort. While these are measures of the unevenness of the distribution, this does not give any direct indication about the characteristics of those adults who have many or few children. Conversely, the main concern of the polarisation of fertility is whether the distribution of births intersects with social inequality so that large families are disproportionately found amongst those with lower levels of education. We operationalise the polarisation of fertility using the relative contribution of each educational category to the total children born to a cohort. To investigate how the distribution of births by level of education has changed over time, allowing for the changing relative size of those educational categories, we analyse the proportion of the total number of children born to a cohort contributed by each educational group divided by the proportion of adults in the cohort that belongs to the given education category. If each category contributed the proportion of children equal to the size of the category (i.e. replaced itself) each ratio would be equal to 1.

## Results

Our results indicate that the overall unevenness of the distribution of fertility has increased for both women and men between 1935-1944 and 1958, and then remained relatively stable between 1958 and 1970 (Table 1). To aid interpretation we benchmark our estimates against past cross-national research using the CR of births, which has recorded a range between a low of 0.24 in Bulgaria and a high of 0.43 in West Germany for cohorts of women born in the early 1960s (Shkolnikov et al., 2007). Using this range as a benchmark to assess the magnitude of the change across the cohorts considered in this analysis, indicates that the increase in concentration between 1935-44 and 1970 cohorts is equivalent to just over a quarter (26%) of the range for women but over two-fifths (42%) of the range for men. The general trend of increasing unevenness in the distribution, is also evident

in the proportion of children born to half of the adults in the cohort (Half-have), which also reveals the proportion of the total number of births (or their associated costs) that would need to be 'redistributed' in order to have an even distribution with half of the births occurring to half of the adults. Among men and women born in 1935-44 this percentage was 21% and 22%, respectively; among those born in 1970 it was a quarter (25%) for women, and almost a third (31%) for men. The trend is as expected in the context of other evidence of the proportion of adults who do not have children having increased over time, and the use of the Gini measure in this analysis is a reminder that the often-used measure in demography of the proportion without children is linked to inequality in the distribution of reproduction, as well as the fertility level.

**Table 1 Measures of concentration of births**

	<b>Women</b> CR	Have- half	Half- have	Redistri- bution %	<b>Men</b> CR	Have- half	Half- have	Redistri- bution %
1935-44	0.32	0.35	0.71	21.1	0.35	0.35	0.72	22.2
1945-54	0.30	0.36	0.69	19.1	0.37	0.35	0.75	24.7
1958	0.36	0.34	0.74	23.8	0.43	0.35	0.82	31.7
1970	0.37	0.34	0.75	24.9	0.43	0.34	0.81	31.0

Turning to how the uneven distribution of childbearing intersects with social inequality in the UK, Table 2 shows that as the degree-educated category has grown from 11% of all women born 1935-44 to 42% of women born in 1970, in each cohort the group has under-contributed to the total number of children born to the cohort (albeit the level of under-contribution has fluctuated) despite higher educated women having become a less select group. Meanwhile, women without qualifications have consistently over-contributed to the total number of children born to each cohort and, as having no qualifications has become increasingly rare, the relative over-contribution of children by women without qualifications has increased. While the relative size of the group with some lower level qualifications (up to O-level or equivalent) has remained more stable over time, the relative contribution to the total number of children has increased slightly over time. Among men, the differences between the proportion of children contributed and the proportion of adults for each qualification is much smaller and the pattern by education is less consistent over cohorts.

**Table 2 Ratio of proportion of children to relative size of education category, and % of adults in cohort belonging to education category**

	None		Up to O-level		A-level/FE/NVQ3		Degree/ NVQ4+		Unwt n
	Relative contrib.	% cat. size	Relative contrib.	% cat. size	Relative contrib.	% cat. size	Relative contrib.	% cat. size	
<b>Women</b>									
1935-44	1.086	36.4	0.956	34.6	0.991	18.1	0.867	10.9	1,143
1945-54	1.115	26.2	1.017	35.7	0.931	21.8	0.870	16.3	1,358
1958	1.116	11.8	1.031	39.6	1.006	14.4	0.922	34.2	5,546
1970	1.239	11.2	1.067	32.7	0.973	13.9	0.895	42.1	5,062
<b>Men</b>									
1935-44	1.015	27.5	0.970	29.1	1.020	24.1	0.999	19.3	949
1945-54	1.082	17.6	1.032	25.7	0.971	31.7	0.946	25.0	1,117
1958	0.955	11.2	1.000	34.8	1.007	19.8	1.010	34.2	5,372
1970	1.071	12.4	1.011	31.7	1.029	15.5	0.959	40.4	4,666

Past research based on micro analysis of parity progression (Berrington et al., 2015) concluded that the higher fertility of women with lower levels of qualifications have partially offset the increasing childlessness and reducing family size of the highest educated. However, our analysis of changing

patterns at the aggregate level, considered alongside average family sizes reducing in over cohorts in all educational categories, suggests that the consistent and increasing over-contribution to total cohort fertility by women with no or low qualifications might better be thought of as having slowed the pace of change, rather than as having partially made up the shortfall among higher educated groups.

## Discussion

While the concentration of fertility has increased among both women and men over cohorts, only among women is reported fertility also polarised by education. This may be interpreted as lower educated women, but not men, bearing a disproportionate share of reproduction that in relative terms has increased over time. In recognition of the societal benefit of childbearing, implicit in much fertility research, we argue demographers should be concerned not just with the *level* of fertility but also with the distribution of fertility and the ways in which policy can perpetuate or mitigate against, the costs associated with childrearing being distributed along gendered and classed lines. This is especially the case in a context such as the UK, which relative to other European countries does not have particularly low fertility rates but does have relatively high levels of income inequality and child poverty rates. The finding that the educational gradient to fertility is highly gendered points to the relevance of structures of constraint as an explanation for the unevenness of the distribution of fertility increasing and consistent with the comparative research (which was based on women's data only) attributing the polarisation of fertility to the limited public policy support for working parents in the UK. Since men's labour market attachment, career or earnings progression are rarely diminished or adversely affected by having children, the lack of association between fertility and education among men, when considered alongside the fact that it is women's careers that tend to be affected by parenthood, is indicative of the structural barriers to combining *motherhood* with the sort of professional and managerial careers that require higher education.

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