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## UNDERSTANDING LOW FERTILITY

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Declining fertility levels across developed countries have attracted considerable attention from the media and politicians alike. As one of the drivers of population ageing, low fertility has potential repercussions for the level of economic activity and for welfare provision.

Against this background, the main aim of this research was to understand the key drivers of declining fertility in the UK. We did this by analysing the fertility behaviour of more than forty cohorts of women born between 1935 and 1975. A particular objective was to assess whether increasing female participation in higher education might explain the decline in fertility.

The key findings from this study are as follows (see Ratcliffe and Smith, 2006, for more detail):

- We find that, between the cohort of women born in 1935 and the cohort of women born in 1965, average family size fell by around 0.5 children. This decline occurred in two phases. The first phase (affecting cohorts born during 1935-44) was a fall in third and higher-order births, accounting for most of the decline in average family size. The second phase, beginning with the 1945 cohort, was a rise in childlessness, associated with a delay in childbearing.
- Our analysis confirms the findings from previous studies that women with higher levels of education begin childbearing later and are more likely to remain childless. However, we find that increasing participation in higher education among successive cohorts of women cannot account for all of the decline in fertility — there have also been substantial changes in fertility among higher-educated women.
- The result is an increasing polarisation between educated and less-well-educated women. Among the cohort of women born in 1945, both those with further education and those who left school at 16 typically spent their 20s raising a family, rather than pursuing a career. Among women born in 1975, two-

thirds of those who had left school by 16, but only one in five of those with further education, still had their first baby by age 30. For these women, their 20s had become a time for pursuing a career rather than starting a family.

- One of the implications of this increasing polarisation is that it is likely to increase the material advantages of better-educated mothers — both for themselves and for their children.

### Data and methodology

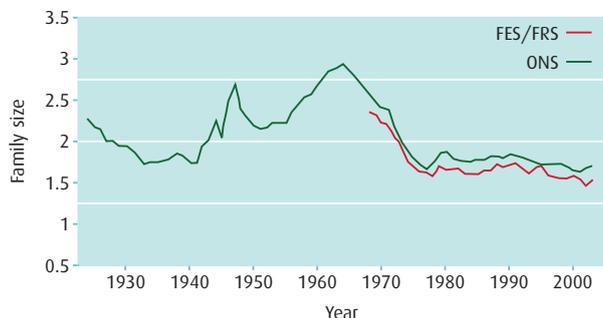
We pool data from the Family Expenditure Survey (FES) from 1968 to 2003 and the Family Resources Survey (FRS) from 1995 to 2004. Together, these produce a sample size of just under 180,000 women, allowing us to analyse fertility changes across cohorts on a detailed year-on-year basis.

Although neither of these datasets collects fertility information directly, the fact that they are household datasets allows us to infer the fertility of women using information on children residing in the household. For example, a woman aged 25 who has one child aged 0 is assumed to have had her first child aged 25; a woman aged 35 who has one child aged 10 and another aged 8 is assumed to have had her first birth at age 25 and her second birth at age 27 and so on.

This method has some drawbacks: our snapshot of fertility will exclude children born to the women but who are not residing in the household at the time of the survey, a group that includes older children who have left home, those not living with their mother following family breakdown, and those who have died. We therefore rely on the fact that child mortality is low and that most children remain with their mother in the event of family dissolution.

To minimise the bias caused by missing older children, we exclude women aged 38 and over because we find

that at these ages, the probability of having a birth aged 20 and under falls significantly. This is a limitation as we miss births to older women, but, as shown in Figure 1, we find that the trends in our data closely match the key trends over the period in the official Office for National Statistics (ONS) estimate of the Total Fertility Rate (TFR) — the measure of how many births a (hypothetical) woman would have if she were to experience the age-specific birth rates in each year.

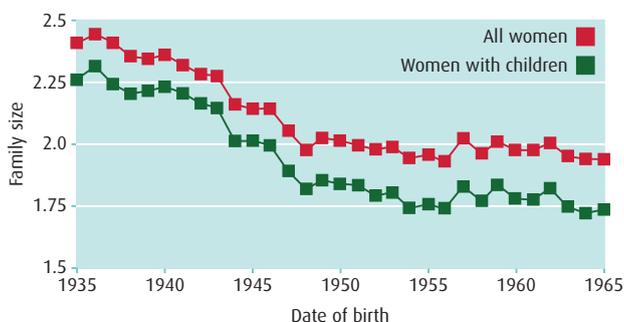


**FIGURE 1. TOTAL FERTILITY RATE — OUR ESTIMATE USING FES/FRS DATA AND ONS ESTIMATE**  
 Source: Authors' estimates using FES/FRS data 1968-04 and Office for National Statistics

### Cohort fertility trends

Figures 2-4 highlight some of the key changes in fertility across the different date-of-birth cohorts.

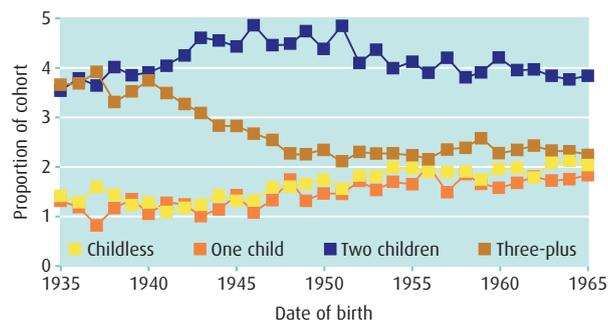
Figure 2 shows completed family size for each of the cohorts for whom we observe their full fertility history (those born 1935-1965). This is the cohort equivalent of the TFR shown in Figure 1. It shows a fall in the average number of children across the cohorts of around 0.5 of a child. This is smaller than the fall in the TFR since some of the fall in the period measure is driven by changes in the timing of childbearing and, in particular, the trend towards delayed motherhood.



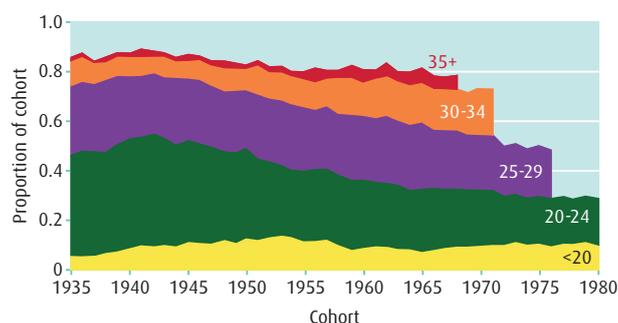
**FIGURE 2. AVERAGE COMPLETED FAMILY SIZE, BY COHORT, 1935-65**  
 Source: Authors' estimates using FES/FRS data 1968-04

Figure 3 sheds further light on the fall in average family size and shows the proportion of each cohort who have no, one, two, and three or more children. It clearly shows the trend towards smaller family sizes and the rise in childlessness.

Figure 4 shows the proportion of each cohort having a first birth, by age. This information is available for additional cohorts who have not yet completed their fertility.



**FIGURE 3. PROPORTION OF COHORT WITH DIFFERENT COMPLETED FAMILY SIZES, 1935-65**  
 Source: Authors' estimates using FES/FRS data 1968-04



**FIGURE 4. AGE AT FIRST BIRTH, BY COHORT, 1935-1980**  
 Source: Authors' estimates using FES/FRS data 1968-04

Broadly speaking, the fertility experiences of the cohorts analysed can be grouped as follows:

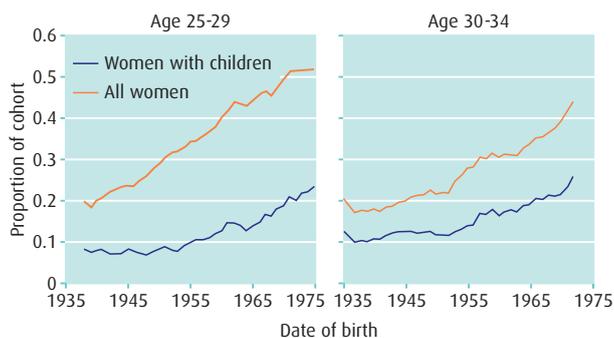
**Group 1:** Women born between 1935 and 1944 had the highest fertility rates of all the cohorts in our sample and were also more likely to start childbearing at younger ages. Eighty per cent of the cohorts born in the early 1940s had their first birth before age 30 — and 60% had had their second. This early childbearing was a key factor in the 1960s baby boom. And yet in spite of beginning motherhood at a younger age than previous cohorts, there was a big decline in the proportion of women having three-plus children. Taken together, these trends suggest that these women were deliberately restricting family size, a finding confirmed by evidence from patterns and timing of take-up of the pill showing that, immediately after its introduction when availability was fairly limited (1961-70), it was used mainly by women who already had two or three children, and only later by women to delay childbearing (Bone, 1978).

**Group 2:** Women born between 1945 and 1954 started to delay childbearing and experienced a rise in childlessness. Almost one in ten women born in 1945 remained childless, whereas this statistic rose to almost one in five for women born in 1955. Evidence on employment in Figure 5 shows that there was an expansion of full-time work among



these cohorts, but not among women with children, suggesting that some women may have possibly have chosen to have a career rather than a family.

**Group 3:** Women born between 1955 and 1965 continued the trend of delaying motherhood. However, patterns in family size remained fairly stable across this period, which suggests that these women experienced higher fertility in later life. This point is supported by the evidence in Figure 4, which shows a rising proportion of women becoming mothers aged 30 and above. Interestingly, among these cohorts, there was an increase in the proportion of women with children working full-time (see Figure 5), suggesting that more stable fertility levels may be the result of more women being able to combine work and family.



**FIGURE 5. RATES OF FULL-TIME EMPLOYMENT, BY COHORT**  
 Source: Authors' estimates using FES/FRS data 1968-04

**Group 4:** Women born after 1965 have not yet completed their fertility cycle, but it is evident from Figure 4 that they are delaying motherhood even more. It remains to be seen whether these women become mothers in later life but it is likely that the delayed entry into motherhood may begin to affect the resulting family size if only for biological reasons. The experience of earlier cohorts points to the opportunities for combining work and family as a key factor in their fertility, particularly given the continued growth in full-time employment.

### Fertility and education

Previous studies have shown that women with higher levels of education tend to begin childbearing later, have fewer children and higher rates of childlessness (Rendall and Smallwood, 2003; Berrington, 2004). A natural question to ask, therefore, is whether the trend towards more women going on to higher education can account for the changes in fertility. To answer this, we looked at trends in fertility across women with the same levels of education. In particular we compared the fertility of women who left school at or before age 16 with the fertility of those who completed full-time education at or after age 21. Although we do not have direct evidence on their qualifications, we refer to the group with a higher level of education as "college-educated". Information about education is available on a consistent basis in the FES from 1978 so the analysis by education relates to 1945-1975 cohorts only.

We find that changing participation in education across cohorts cannot explain all of the fall in completed family size across the cohorts born 1945-65. If we fix fertility rates by education to be those of the first observed cohort (1945), then changing participation in education across cohorts can explain only one half of the decline. In fact, looking at the figures in Table 1, participation in higher education has grown particularly rapidly among more recent cohorts and this will undoubtedly play a role in determining current and future fertility.

But to fully understand changing fertility, we need to look at the trends within education groups. As shown in Table 1, there has been a decline in fertility among college-educated women, and a big delay of entry into motherhood, contrasting with much more stable fertility patterns among women leaving school at 16. What has driven falling fertility, therefore, is not just that more women are now pursuing a higher level of education, but that better-educated women now have very different work and family trajectories than they did before.

	Cohort date of birth			
	1945	1955	1965	1975
% with college-education	8.4	12.2	13.1	29.3
<b>Average family size</b>				
Left school at 16	2.04	1.89	1.97	n.a.
College-educated	1.60	1.38	1.39	n.a.
<b>% giving birth before age 30</b>				
Left school at 16	81.5	75.0	71.8	70.7
College-educated	58.7	41.4	28.9	20.9
<b>% working full-time aged 25-29</b>				
Left school at 16	21.5	26.9	32.1	36.2
College-educated	30.6	50.4	68.5	70.8
<b>% with children working full-time aged 30-34</b>				
Left school at 16	14.2	12.6	14.1	n.a.
College educated	15.9	23.8	32.2	n.a.

**TABLE 1. FERTILITY AND EMPLOYMENT, BY EDUCATION, SELECTED COHORTS**

Note: College-educated defined as those who report leaving full-time education at age 21 or above. Information about education is available on a consistent basis in the FES from 1978 so the analysis relates to 1945-1975 cohorts only.

The result is an increasing polarisation between women according to their level of education. Among those with a college degree in the 1945 cohort, the majority went on to have their first child before age 30, while only a minority worked full-time, following broadly the same pattern as among the group of women who left school at 16. By the 1975 cohort, things were very different — at least for college-educated women, for whom their 20s had become the decade for pursuing a career and not for having children.

Much of the evidence suggests that this polarisation is likely to lead to an amplification of the material

advantages of better-educated mothers — both for themselves and for their children. Women with higher levels of education now work full-time for longer prior to having children and are more likely to work full-time when they do have children. This raises levels of family income and wealth at the time of childbirth and in early childhood. Recent research by Hawkes *et al* (2004) has used data from the the Millennium Cohort Study (a sample of children born in 2000) to look at the association between age of entry into motherhood and a range of factors known to be important for child outcomes. Among their findings are that “older mothers” (age 30-plus) typically had higher incomes at the time of interview, and were more likely to be employed and to be living with an employed partner. These effects were significant even controlling for a woman’s and her partner’s educational qualifications. The changes in work and fertility among educated women that have taken place are therefore exacerbating social inequalities between children born to educated and less well educated women. The consequences of this are not yet fully understood but may have profound implications for social inequality and mobility.

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