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Fertility and Women's Education in the UK: A Cohort Analysis

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December 2006

Abstract
Against a background of falling and low fertility, this paper presents an analysis of trends in fertility in the UK across cohorts born between 1935 and 1975. The decline in fertility is shown to have two distinct phases – first, a fall in third and higher-order births (affecting cohorts born 1935-45) and second, a delay in childbearing and a rise in childlessness (affecting cohorts born since 1945). The delay in childbearing and rise in childlessness cannot all be explained by the rise in female participation in higher education, rather there has been increasing polarization in fertility and employment by education.

Keywords : cohort fertility trends, education

JEL Classification: JEL J13

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1. Introduction

Against a background of falling and low fertility, this paper presents a detailed analysis of the fertility behaviour of successive cohorts of women in the UK born between 1935 and 1975.[1] It does this by applying the "own child method" (Murphy and Berrington, 1993) to repeated cross-sections of data drawn from the Family Expenditure Survey (FES) and the Family Resources Survey (FRS). These data are available on a consistent and continuous basis from 1968 – 2004, contain detailed information on household composition, allowing us to construct pseudo fertility histories, as well as socio-demographic information, and yield large enough sample sizes to enable us to look at the fertility of single year date-of-birth cohorts.

Of course, we are not the first to study changing patterns of fertility in the UK. Many of the trends that we highlight in this paper (the fall in third-plus births, the delay in family formation and the rise in childlessness) have been extensively documented and discussed elsewhere (see inter alia Berrington, 2004, Smallwood, 2002a, Smallwood 2002b, and Smallwood and Chamberlain, 2005). However, looking at the fertility experiences of single year of birth cohorts gives a rich picture of trends in fertility and allows us to pinpoint exactly when changes in fertility occurred. On the basis of our analysis, we group our forty cohorts into four groups according to their fertility experiences.

- Group 1: cohorts born 1935-44 – experienced a trend towards earlier first births and falling rates of childlessness (the 1941 cohort has the highest rate of motherhood in our sample at 89%), but a decline in third and higher-order births.
- Group 2: cohorts born 1945-54 – experienced a delay in childbearing and rising rates of childlessness and one-child families

[1] Our approach is similar to that of Goldin (2006) who looks at education, employment and fertility of a long time-series of cohorts in the US

- Group 3: cohorts born 1955-62 – had reasonably stable patterns of family size, in spite of a further trend towards later childbearing.
- Group 4: cohorts born 1962 onwards – only a few of these cohorts have completed their fertility, but the trend towards delayed childbearing has accelerated, suggesting a further increase in childlessness is likely.

The data also allow us to look at the relationship between fertility and women's participation in higher education. Rendall and Smallwood (2003) and Berrington (2004) show that, among a single cohort of women born in the UK in the 1950s, women with higher educational qualifications typically entered motherhood later than those without and were more likely to remain childless. An obvious question to ask is whether the increasing participation of women in higher education can explain recent trends in fertility, or whether there have been changes in fertility within education groups. We show that the latter is the case and that, over time, there has been a trend towards increasing polarisation in fertility, by education. This is consistent with findings for the US (see Rindfuss et al, 1996 and Martin, 2000).

Analysing changes in fertility on a cohort basis is not uncontroversial; some argue strongly that period fertility measures are more appropriate for analysing trends (see NiBhrolchain, 1992). Period fertility measures are important since they directly drive population ageing. Also, many of the factors that affect fertility are period-specific (eg government policies, availability of contraception, house prices etc), although they will impact on different cohorts at different stages in their fertility life-cycles. But, period measures are affected by changes in the timing (tempo) of births across cohorts as well as in the number of children women have. We believe that a cohort analysis allows the long-term trends in fertility to emerge more clearly.

The plan of the paper is as follows. The next section discusses in more detail our use of the own child method to construct pseudo fertility histories for the women in the FES and FRS samples. Section 3 presents our analysis of fertility by cohort, while section 4 looks at patterns by education. Section 5 concludes.

2. Data and methodology

The data we use to analyse fertility are drawn from successive waves of the Family Expenditure Survey (FES) 1968-2003, supplemented with waves of the Family Resources Survey (FRS) from 1995-2004. Both are cross-section, household surveys, containing a standard set of demographic and socio-economic variables on household members, as well as detailed information on household spending (the FES) and income (the FRS). The surveys do not specifically collect information on women's fertility histories. Instead, we use the "own child method" (see Murphy and Berrington, 1993) to infer fertility histories from the age of the mother and the age of her natural-born children living in the household.

First, we allocate children in the household to their natural mothers using information provided on relationships between household members and the benefit unit to which individuals belong. Then, for each woman we create pseudo fertility histories – the age of the mother at birth and the birth order of the child – based on the current ages of the mother and children. So, for example, a woman aged 25 who has one child aged 0 is assumed to have had her first child at age 25; a woman aged 30 who has one child aged 2 is assumed to have had her first child at age 28; 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. As these examples illustrate, we combine "current" birth probabilities (ie whether or not a woman has a birth in the year in which she is observed in the FES/FRS sample) with retrospective birth probabilities (ie whether she had a birth in previous years, based on the ages of her children). Finally we use survival analysis to construct cohort parity progression ratios from the individual fertility histories.

Clearly, the own child method is not without its potential problems. One is that we observe the current ages of the mother and any children, but not their actual dates of birth. In practice, a woman aged 25 who has one child aged 0 may actually have given birth when she was 24. Since the woman could not be a year older than we currently observe her to be when she gave birth, our estimates of the proportion of women who have births of order *b* by a particular age, and the average age at birth order *b*, will tend to have a

systematic downward bias. However, the bias should apply equally to all cohorts and education groups, and should not therefore affect the validity of the inferences we draw about differences in fertility behaviour over time and by education.

A second problem is that the own child method relies on information on surviving children in the household to infer fertility histories – infant mortality and household reconstitution will result in measurement error. However, low rates of child mortality[2] and the fact that the overwhelming majority of children stay with their natural mother in the event of family breakup act to reduce the effect of these factors in practice.

Another potential problem – one that is more serious in practice – is that older women may have had children who have now left home. If we observe a woman aged 39 with no children, we cannot say for certain whether she has not yet had children, or she had one child when she was 17 who left home when they were 20.[3] In the latter case, the own child method would fail to capture births to women who had children relatively young – we would tend to over-estimate the mean and median ages associated with different birth orders (ie the average ages of the mother at first, second and subsequent births) and to under-estimate family size for people who entered childbearing at a relatively young age.

A solution to this problem is to adopt a maximum age threshold, i.e. to exclude from our analysis women above a threshold age at which the problem of children leaving home starts to significantly affect the estimates of the proportion of women having births at younger ages. Assuming that women start having children from age 16, the selection problems may arise from as young as age 32. In fact, sensitivity analysis of estimates of the proportion of

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[2] The rate of death of children less than one year was 27 per 1,000 live births in 1951-55, falling to 6 per 1,000 live births in 1996-00. Our estimates will therefore tend to underestimate births more at the beginning of the period.

[3] The problem is made potentially worse in practice by the fact that students who live away from home are not counted as part of the household in the FES/FRS.

women having a first birth by age 20, shows that the threshold can be raised to 37 before there are significant effects.[4] The results of this sensitivity analysis are included in the Appendix.

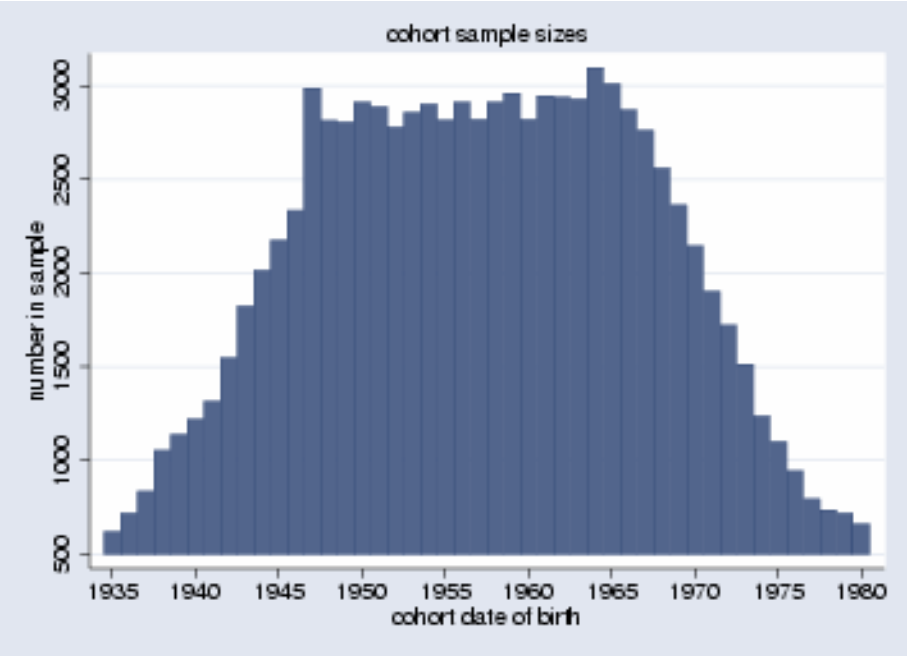
Our analysis of fertility therefore excludes births after age 38 and will systematically under-estimate the proportion of each cohort having first and subsequent births. Murphy and Grundy (2003) suggest that, among the 1920 cohort, 2.5% of births were to women aged 40-plus, but fewer than 1% of births among cohorts born after 1930. However, the recent trend towards later child-bearing, suggests that the effect of this bias is likely to increase among later cohorts. This must be borne in mind when interpreting our results.

The advantages of generating cohort fertility profiles by applying the own child method to repeated cross-section data from the FES and FRS are that we have large sample sizes (see Figure 1), enabling us to look at single year of birth cohorts. We have full information on birth order, which is not complete in data derived from official birth registration data, and we have information on the mother's education.

[4] This suggests that there may be a negative relation between the age of the mother at birth and the age at which they child leaves home.

Figure 1

Cohort sample sizes, pooled FES/FRS sample

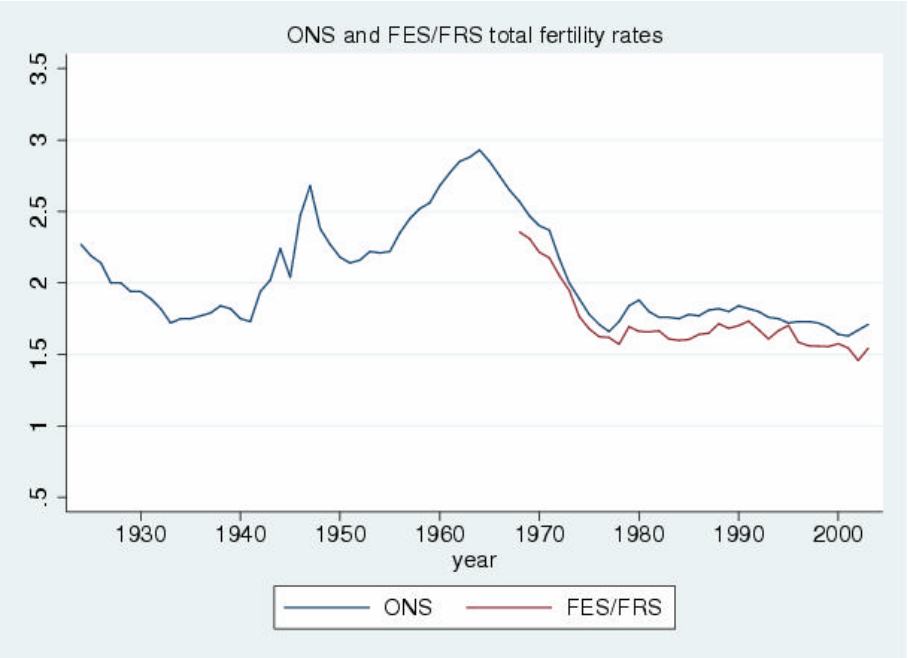


As a final check of the validity of our approach, we compare an estimate of the period total fertility rate (TFR) derived from the FES/FRS data from 1968,[5] with the official measure of the TFR derived from registration data, shown over a longer period to highlight fertility trends. The TFR measures the number of children a woman would have if she experienced the age-specific fertility rate in that year – it is therefore influenced by changes in timing of births between cohorts, as well as by changes in the number of births. In fact, as shown in Figure 2 below, the TFR estimated using the FES/FRS is very close to the official measure. As is to be expected, our estimate is lower than the official measure since we exclude births over 37. But, we pick up the major trends in fertility (in particular, the decline in the total fertility rate from around 2.5 in 1968 to 1.7 by the end of the period), and the average difference is relatively stable over time.

[5] With retrospective estimates, we impute fertility behaviour in our FES/FRS sample prior to 1968, but not for the full age range 15-37.

Figure 2

Total fertility rate – FES/FRS estimate and ONS estimate



3. Cohort fertility patterns

Figures 3 – 7 present summary information on the fertility of different single year date of birth cohorts. The oldest cohort in our sample was born in 1935, while the youngest cohort who have completed their fertility (ie reached 38) were born in 1965; we also show information on the proportion who have experienced a first and second birth by age 30 for the cohort born in 1975 and by age 25 for the cohort born in 1980.

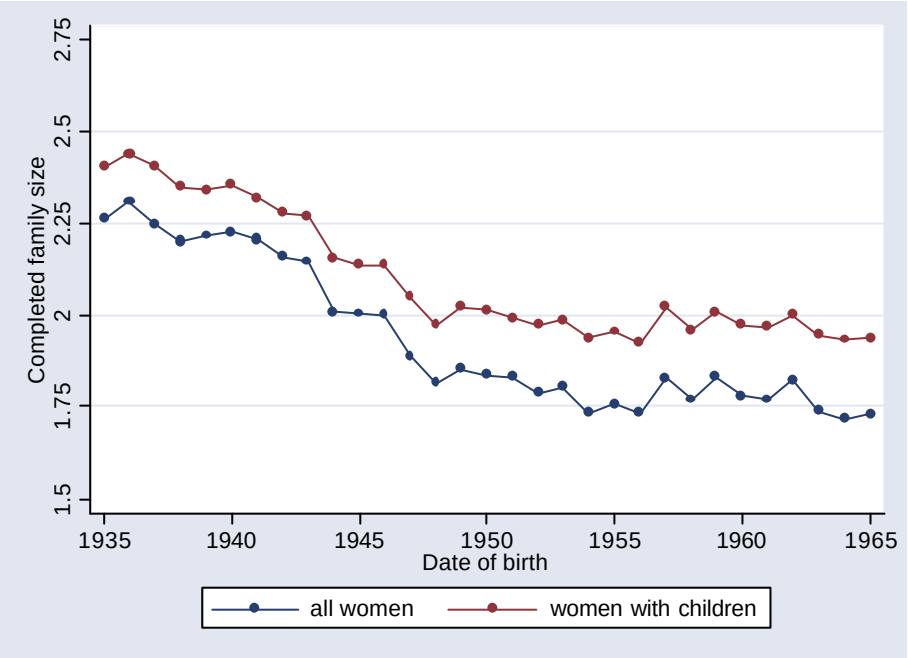
Figure 3 shows average completed family size for cohorts born between 1935 and 1965. Estimated average family size fell by around 0.5 of a child, from 2.25 among the 1935 cohort to less than 1.75 among the 1965 cohort.[6] Of

[6] It must be remembered that we are only looking at fertility up to age 37 and we will therefore under-estimate average family size. Smallwood and Jeffries (2003) estimate completed family size for the 1945 cohort to be 2.19 (2.42 for women with children); for the 1960 cohort, their figures are 1.87 and 2.33 respectively. These figures suggest that we under-estimate the fall in average family size for all women, but over-estimate the fall for women with children.

course, taking the 1935 cohort as a starting point is somewhat arbitrary, determined by our data. Murphy and Grundy (2003) show that fertility among the 1935 cohort was high compared to previous cohorts, consistent with the relatively low annual fertility rates over the period 1935 – 55 (with the exception of the post- second world war mini boom) shown in Figure 2.

Figure 3

Average completed family size, by cohort



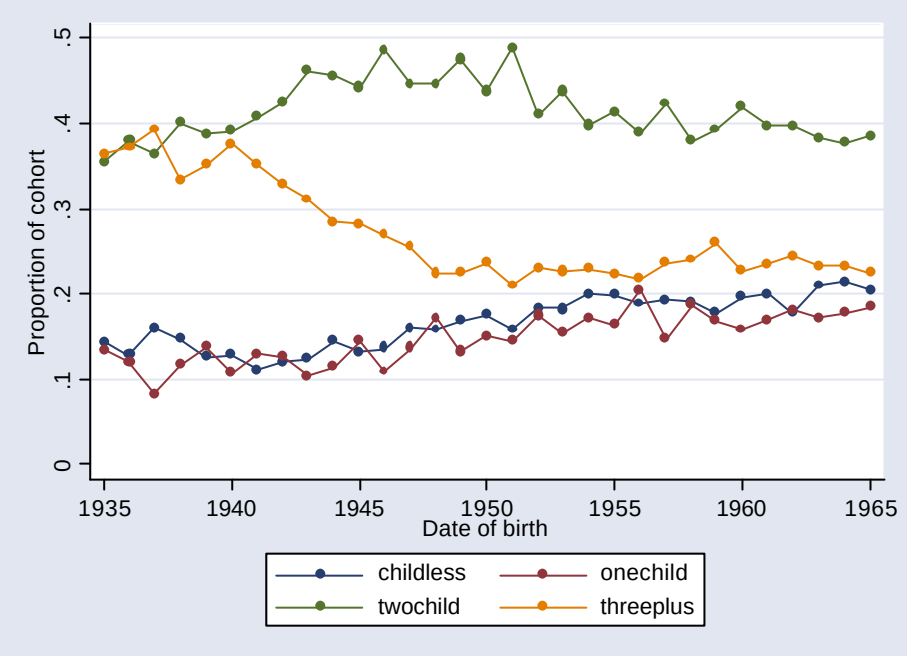
The decline in average family size was driven by two trends – a decline in average family size among women who had children and an increase in childlessness. As shown in Figure 3, we estimate that most of the fall is due to the former – among women with children, average family size declined from around 2.4 children among the 1935 cohort to fewer than 2 children among the 1965 cohort.

Changes in family size are examined further in figure 4, which shows the proportion of each cohort achieving different completed family sizes. This highlights very different patterns in changing fertility across the cohorts. The first phase of falling family size, affecting cohorts born between 1935 and 1947, was driven by a fall in third and higher order births. The proportion of a cohort having three or more children fell from nearly 40 per cent among the

1937 cohort to 22 per cent among the 1948 cohort, while the proportion having two children rose between the 1935 and 1945 cohorts from 35 per cent to nearly 50 per cent.

Figure 4

Completed family size, by cohort



During this first phase of falling fertility, the age of childbearing actually fell. The proportion of women having a first birth by age 25 increased to 50 per cent among the 1942 cohort, while nearly 80 per cent of this cohort had their first birth by the age of 30 (see Figures 5 and 6). The proportion of a cohort remaining childless also fell, with nearly 90 per cent of the 1941 cohort having at least one child – the highest proportion of all the cohorts in our sample.

Across the cohorts born 1935 – 45, women started childbearing earlier, but were then more likely than their older counterparts to stop at two. Interestingly, information on use of the pill, summarized in Table 1, shows that, when it was introduced, the pill was used most widely by married women to control third and subsequent births. Only by the early 1970s, when the pill became freely available from clinics, and ultimately, GPs, was it used to control first births. Of course, this does not imply that the pill was a causal factor in restricting family size, but suggests that it may have acted as a

mechanism for reducing third and higher-order births among the 1935-45 cohorts.

Table 1

Percentage of women using the pill, ever-married women under 41

	1961 – 65	1966 – 70	1971 – 75
First interval	10%	36%	64%
Second interval	12%	33%	44%
Third interval	18%	38%	48%
Fourth interval	21%	39%	38%

Note: First interval refers to the period before the first birth; second interval to the period between first and second births and so on.

Source: Bone (1978)

Figure 5

Age at first birth, by cohort

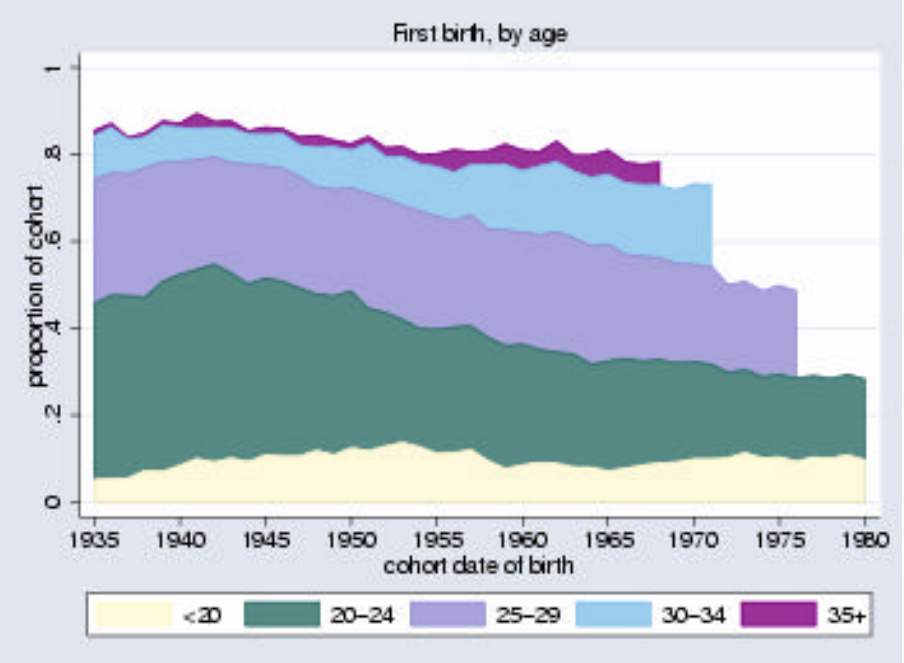
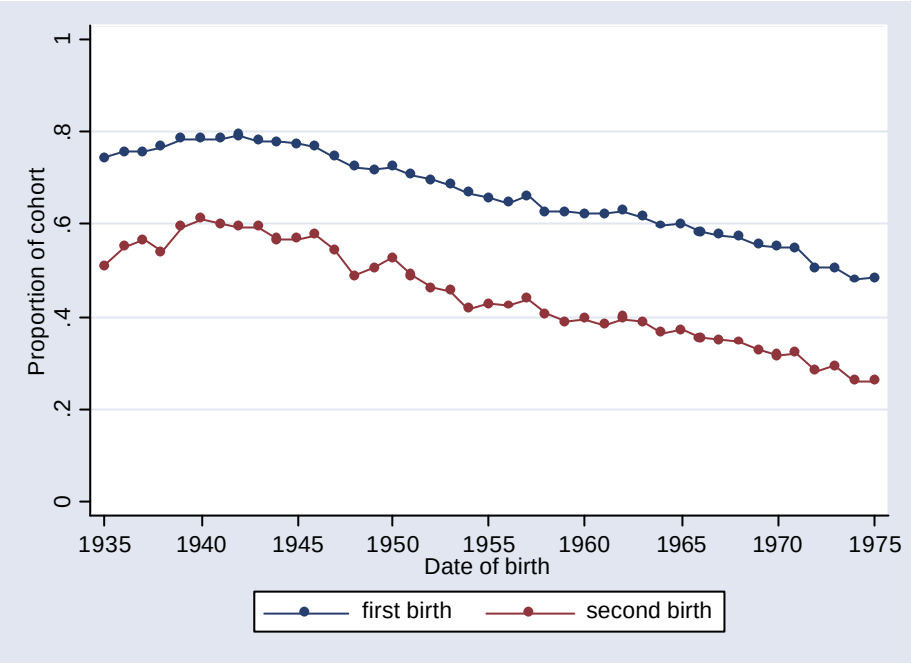


Figure 6

Proportion having birth by age 30, by cohort



The second phase of declining fertility, which affected cohorts born 1945 – 1955 was one in which childbearing was delayed and rates of childlessness increased. The proportion of a cohort with no children rose by nearly nine percentage points from just over one in ten among the 1945 cohort to nearly one in five among the 1955 cohort.[7] The proportion with only one child also increased.

The cohorts born between 1955 and 1965 reflect a third phase of changing fertility, during which time the age of childbearing continued to rise, albeit at a reduced rate, but there appears to have been little further change in average family size and the patterns of completed family sizes remained relatively stable. As shown in figure 5, an acceleration of first births taking place after age 30 has largely offset the continued fall in first births occurring at younger ages.

[7] Berrington (2004) presents very similar figures and estimates rates of childlessness to be one in ten among the cohort born in 1945 and one in five among the cohort born in 1960.

Cohorts born after 1965 have yet to complete their fertility. The proportion having a first birth before age 30 has continued to fall, and at an increased rate; among the cohort born in 1975 fewer than half had a first birth by age 30, compared to 80 per cent among the cohort born in 1942. Figure 5 shows that the main driver was a fall in births among women aged 25 – 29; the proportion of women giving birth before age 25 appears to have been relatively more stable. Further increases in births to women aged 30-plus may be enough to offset the decline in childbearing at younger ages, leaving rates of childlessness unchanged, but ultimately, delayed childbearing may begin increasingly to impact on the number of children women have.

It is beyond the scope of this paper to offer a full explanation for why different cohorts experienced different trends in their fertility, but there are some interesting insights into the experiences of the different cohorts from looking at rates of employment. These are shown for women aged 25 – 34 in Figures 7 and 8, separately for all women and for women with children.

There has been almost no change in the overall rate of part-time employment among women aged 25-29, although among women in this age range with children, there does appear to have been a slight increase among younger cohorts – suggesting that fewer women in this age range have children, but of those that do, more of them work part-time. There is evidence of an increase in part-time employment among women aged 30-34, mainly among those with children and particularly affecting cohorts born 1935 – 1945. These were the cohorts who began childbearing early but were more likely than their older cohorts to stop at two children – the evidence on their employment, suggests that these cohorts had family first and part-time work later.

There has been a steady increase in full-time employment among women aged 25-29, beginning with the 1945 cohort, and among women aged 30-34 beginning with the 1950 cohort. Among women with children, however, there was no real increase in full-time employment until the 1955 cohort. The 1945 – 1955 cohorts experienced a delay in childbearing and a rise in childlessness. The evidence on their employment suggests that some may have put their career first, putting off children, possibly forever. Among women born 1960 onwards, there are increasing signs of women combining

career with children – there is a continued rise in the proportion who work full-time, but also an increase in the proportion with children who work full-time. The fact that more women appear to be combining work with children may explain why patterns of childbearing among these cohorts are relatively more stable than among the earlier cohorts.

Figure 7

Rates of female employment, by cohort

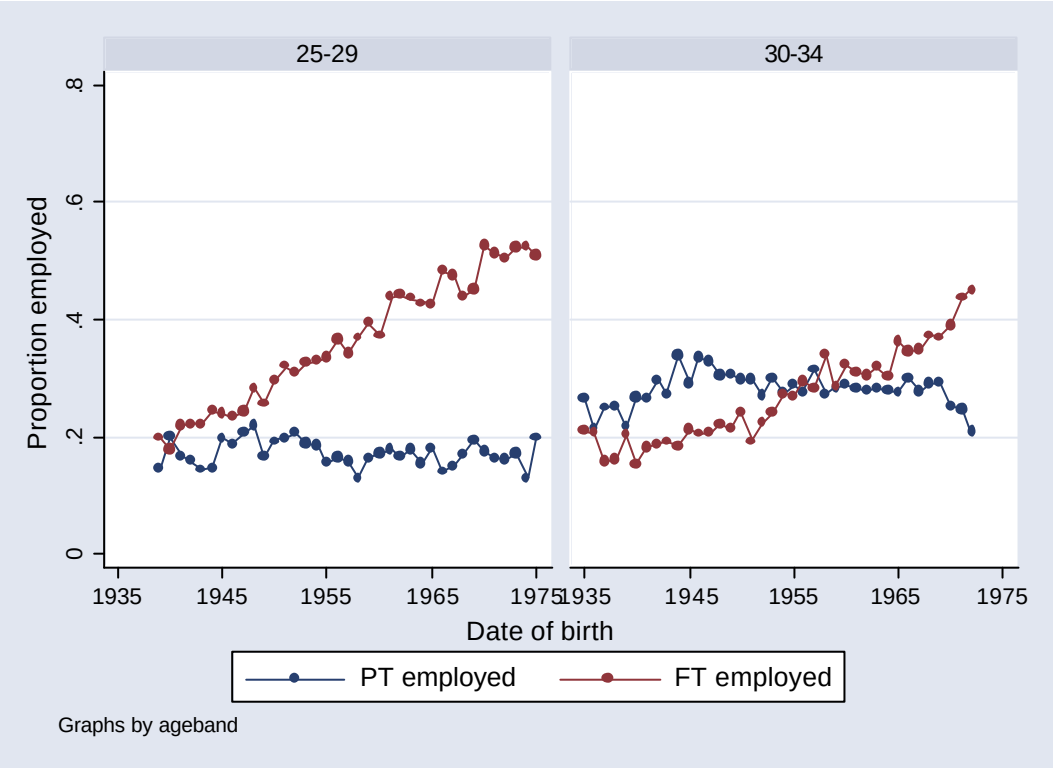
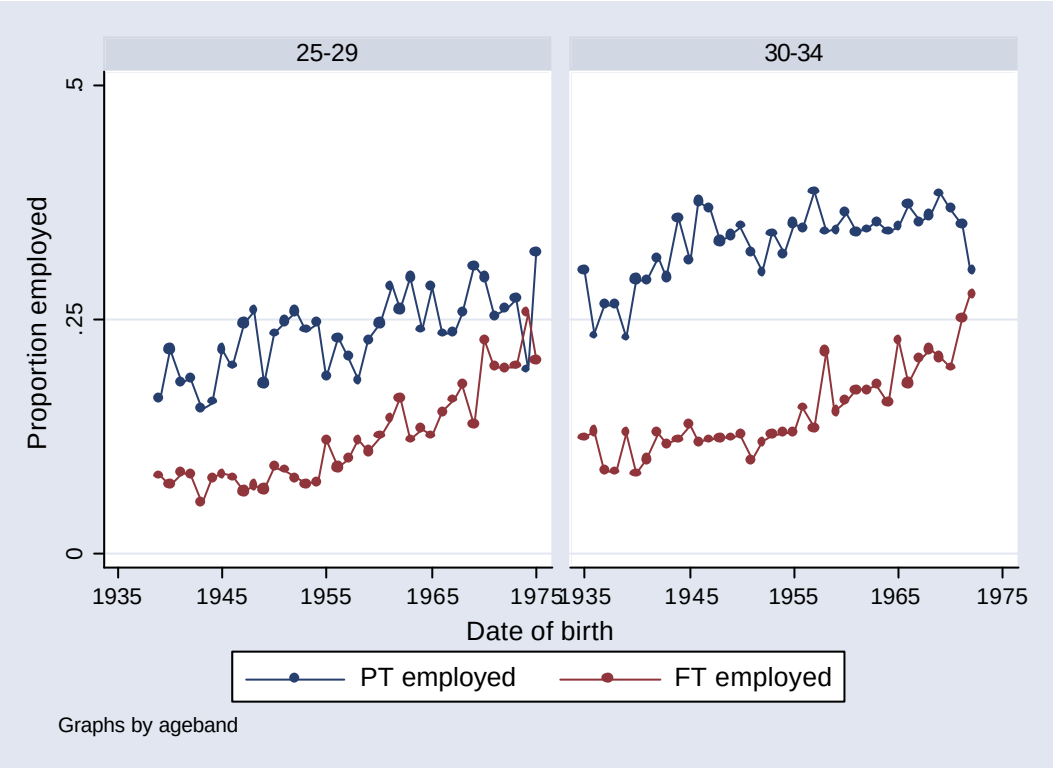


Figure 8

Rates of employment among women with children, by cohort



4. Fertility and education

Previous studies have established a strong link between fertility and education. A priori, the effect of higher education on fertility is ambiguous. In the first instance, the particular difficulties of combining full-time education and child-bearing because of the absence of any formal maternity provision for students is likely to result in a delay in family formation. Higher levels of education are also typically associated with higher wages and so may raise the opportunity cost of taking time out of the labour market for own childcare. Potentially offsetting this, however, employers may have incentives to retain qualified women, making it easier for educated women to combine paid work with having children.[8]

[8] Women with higher levels of education typically suffer lower penalties associated with having children Rake (2000). Of course, these figures may not be directly comparable

By raising permanent income, higher levels of education among women may actually increase the desired quantity of children, an effect that is likely to be amplified via assortative mating. However, Becker (1960) argued that higher levels of income may increase the desired *quality* rather than quantity of children, with families choosing to have smaller families and devoting more resources to each child. A further effect of education may operate through the shape of the expected permanent income profile over the lifetime. Happel et al (1984) argued that, in the presence of imperfect capital markets, the desire for smoother consumption may result in a delay in child-bearing if incomes are expected to increase, as is typically much more the case for those with higher levels of education.

In practice, higher education has been almost universally found to be associated with lower fertility. For the UK, Rendall and Smallwood (2003) and Berrington (2004) show for a cohort of women born in the UK between 1954-58, that in common with other countries, higher levels of education in the UK are associated with a delay in childbirth and higher levels of childlessness. Conditional on having a first birth, women with higher levels of education were likely to have a second child more quickly,[9] but this was not enough to offset the first effect, resulting in lower average completed family sizes. In the light of the growing numbers of women who take some form of further education, an obvious question to ask is whether this change in education participation can account for the changing patterns of fertility

The FES and FRS collect consistent information on the age someone left full-time education and we use this to construct different education variables, shown in Figure 9 below. We define a variable "college-educated" if someone says they left full-time education at age 21 or above. Within the group of those with no college education, we also separate out those who leave school at 16 or before. Figure 9 clearly illustrates the rise in female participation in

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because they reflect choices about family size and childcare arrangements, which may differ quite a lot between women with different levels of education.

[9] Wright et al show that mother's education has no effect on the (conditional) third birth rate.

further education – there has been an increase in the proportion of each cohort who are college-educated, particularly among cohorts born after 1965, and a rise in the proportion who receive some further education (ie those who stay on beyond 16, but are not classified as college-educated), particularly among cohorts born 1945 – 1955. Unfortunately, the education information is first asked in 1978, restricting the available cohorts with completed fertility to those born between 1945 and 1965. We are therefore looking at the period of delayed childbearing and rising childlessness, rather than the decline in third-plus births.

Figure 9

Proportion of cohort leaving FT education aged 21+

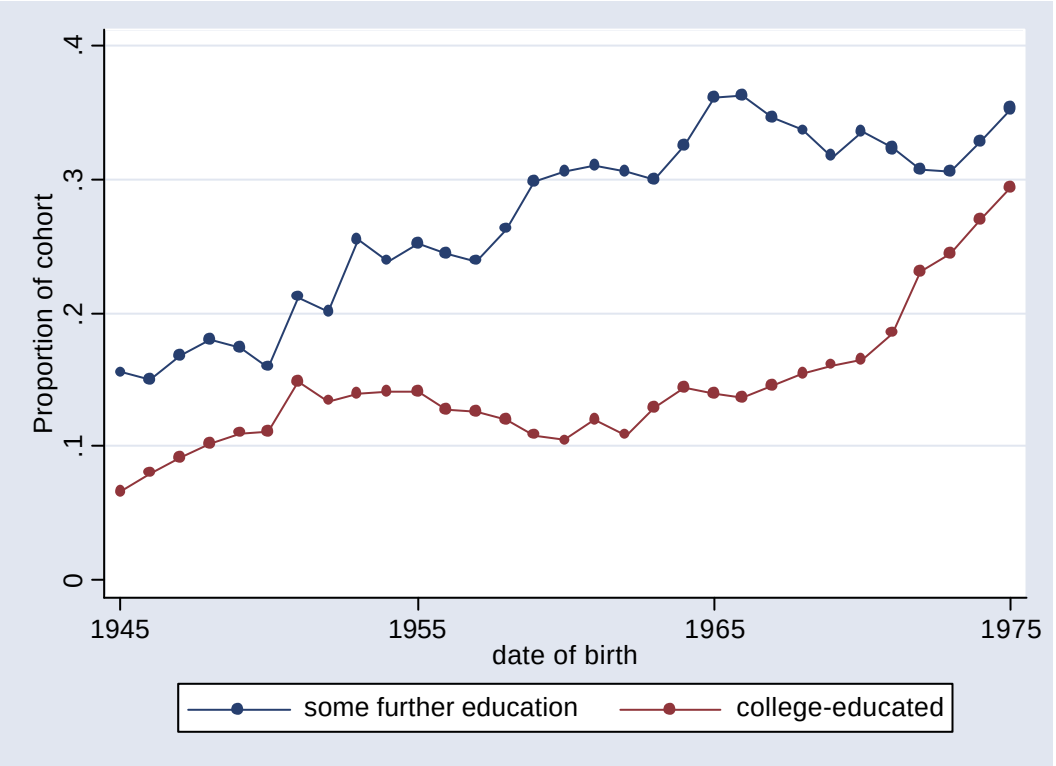
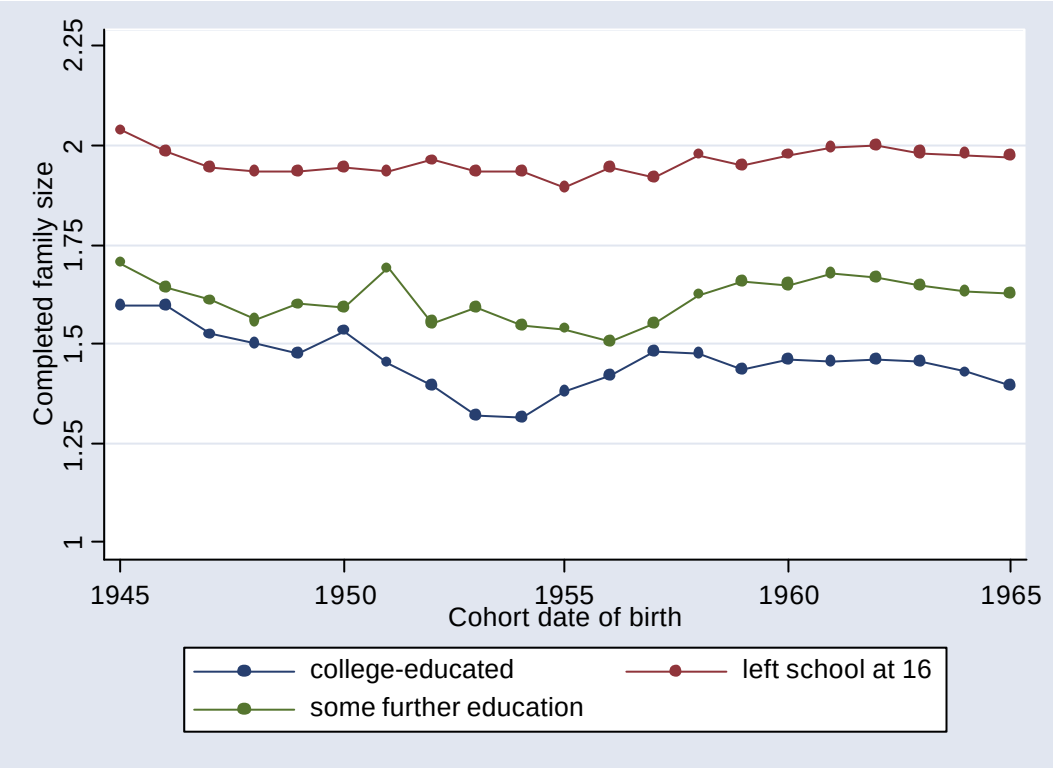


Figure 10 summarizes completed family size, by cohort for women with different levels of education. It clearly illustrates the systematic relationship between education and fertility that is present among all cohorts – the higher a woman's level of education, the lower her fertility. But, what is also clear is that changes in fertility across cohorts have affected all education groups, albeit to different degrees. 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 overall fall in fertility.[10] The other half of the decline is attributable to changes in patterns of fertility within education groups.

Figure 10

Average cohort completed family size, by education



Since the cohort born in 1945, there has been a widening gap between the fertility experiences of college-educated women and women leaving school at 16. In 1945, the completed family size of women with college education was 0.4 children less than that of women who left school at 16. By the 1965 cohort, this gap had grown to nearly 0.6 – driven by greater increases in childlessness and a bigger decline in three-plus child families among college-educated women (see Figure 11).

[10] Of course, there may also have been changes in the type of educational qualifications achieved within our broad groups.

The completed family size of women leaving school at 16 changed little between the cohort born in 1945 and the cohort born in 1965, while the completed family size of college-educated women fell by around 0.2 children. College-educated women born in the early 1950s appear to have had particularly low levels of fertility, linked to relatively high levels of childlessness.

As well as an increasing polarisation in the quantity of births, there has been a widening gap in the timing of first births (see Figure 12). Among the 1945 cohort, 60 per cent of college-educated women had a first birth by age 30, compared to 80 per cent of women who had left school at 16. By the 1975 cohort, around 70 per cent of women leaving school at 16 still experienced a first birth before 30, compared to only 20 per cent of college-educated women. These women are now much more likely to have their first birth after age 30 than before.

Figure 11

Completed family size, by cohort and education

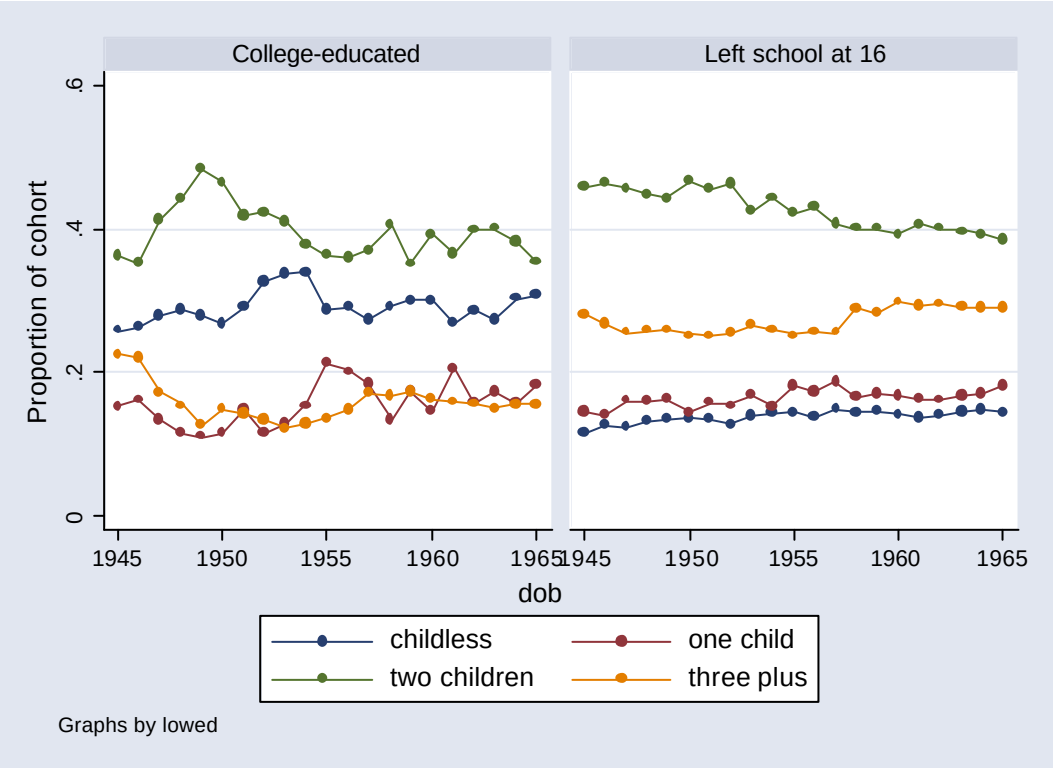
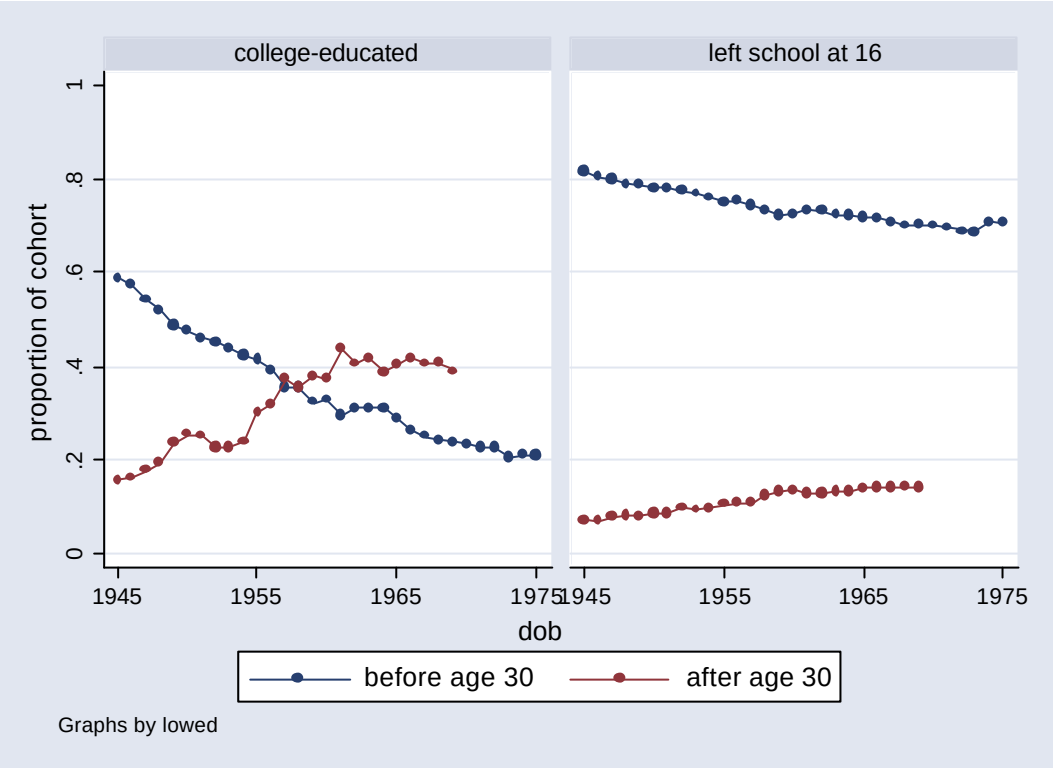


Figure 12

Timing of first birth, by cohort and education



These patterns of fertility are reflected in an increasing polarisation of employment between college-educated women and women who left school at 16. Among cohorts born before 1950, the rate of full-time employment among college-educated women was around 10 percentage points higher than that among women who left school at 16. But among later cohorts, the rate of growth of employment among college-educated women has been more rapid. This growth in employment among college-educated women appears to have taken place in two phases. During the first phase, most of the increase appears to have been among women without children – this coincides with the rise in childlessness among women born in the early 1950s. But among cohorts born after 1955, there has been a substantial increase in the proportion of college-educated women with children who are working full-time. Rates of full-time employment among women with children are very similar by education across cohorts born before 1955, but across later cohorts there is an increasing divergence in full-time employment among mothers by

education. For whatever reason – affordability of childcare, more flexible employers or preferences – a far higher proportion of college-educated women who have children are able to combine full-time work and motherhood.

Figure 13

Rates of female full-time employment, by education and cohort

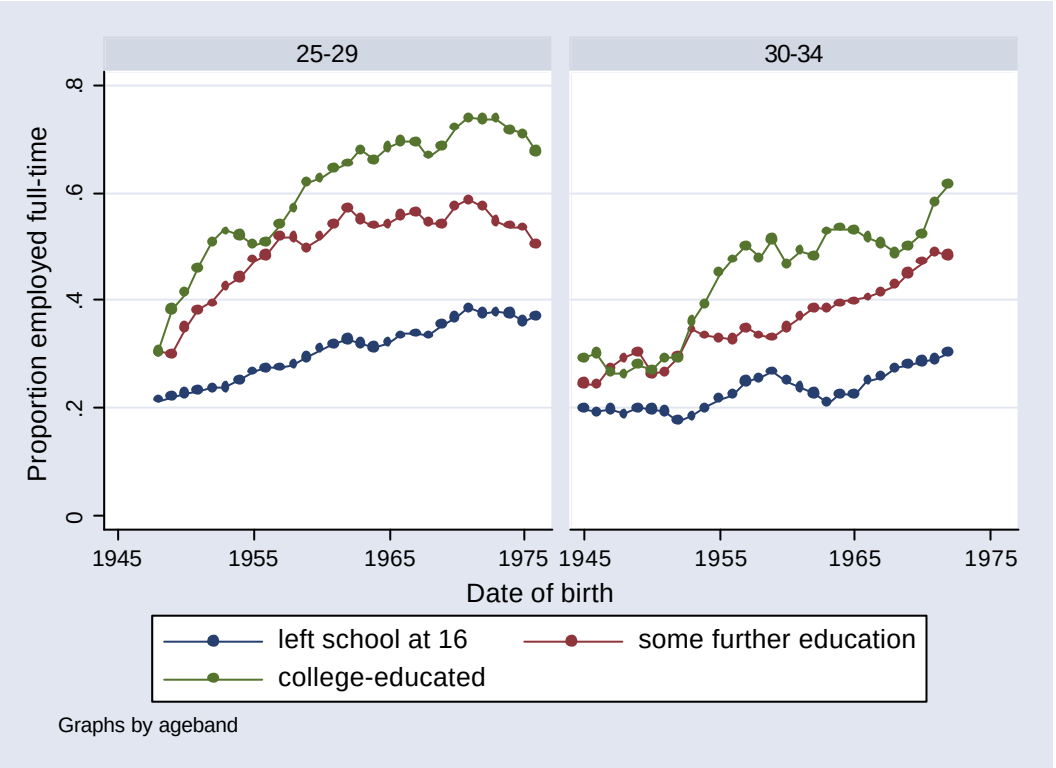
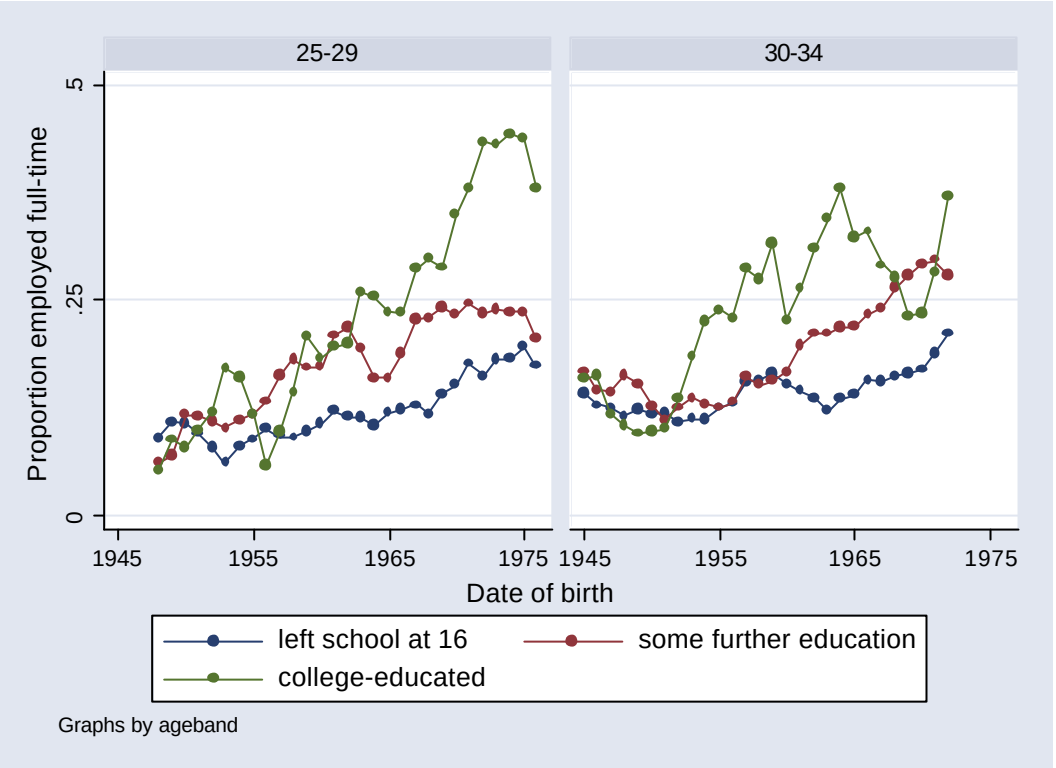


Figure 15

Full-time employment, women with children, by education and cohort



5. Conclusions

This paper has analyzed fertility across forty date-of-birth cohorts born between 1935 and 1975.

Among cohorts who have completed their fertility (born 1935 to 1965), average completed family size fell by around 0.5 child. Most of the fall can be attributed to a decline in third-plus births affecting the cohorts born 1935 to 1945. This coincides with initial take-up of the pill at higher birth intervals, suggesting that many of these women, although they typically began childbearing earlier than older cohorts, for whatever reason, made a deliberate choice to limit their family size to two children.

Among cohorts born since 1945 there has been a delay in childbearing and increasing rates of childlessness – from around one in ten women born in the early 1940s to one in five women born after 1955. Around half of this change can be attributed to a rise in female participation in higher education. But,

there have also been changes in fertility within education groups and an increasing polarisation in fertility and employment between college-educated women and women who leave school at 16.

Among women born in 1945, the employment and fertility experiences of women with college education and women who left school at 16 were fairly similar – the majority of both groups had their first child before age 30 (80 per cent of those who left school at 16 and 60 per cent of those with a college education) and the majority were not in full-time work. Among the cohort born thirty years later, the experiences of the two groups were quite different; only a minority of those with a college education (20 per cent) had their first child before 30, compared to 70 per cent of those who left school at 16; nearly 70 per cent were in full-time employment, compared to only 40 per cent of those who left school at 16.

Since the 1965 cohort, there has been a rapid increase in the proportion of women with college education. This is likely to cause a further fall in average completed family sizes. If we fix fertility rates by education group to the level of the 1965 cohort, then the changes in female participation in further education would lead to a 0.07 reduction in average completed family size. But, as shown in this paper, predicting the fertility effects of changing patterns of education is complicated by subsequent career and occupation choices. Ultimately, these appear to be equally, if not more, important for determining fertility than education choices alone.

What are some of the implications of the changing patterns of fertility?

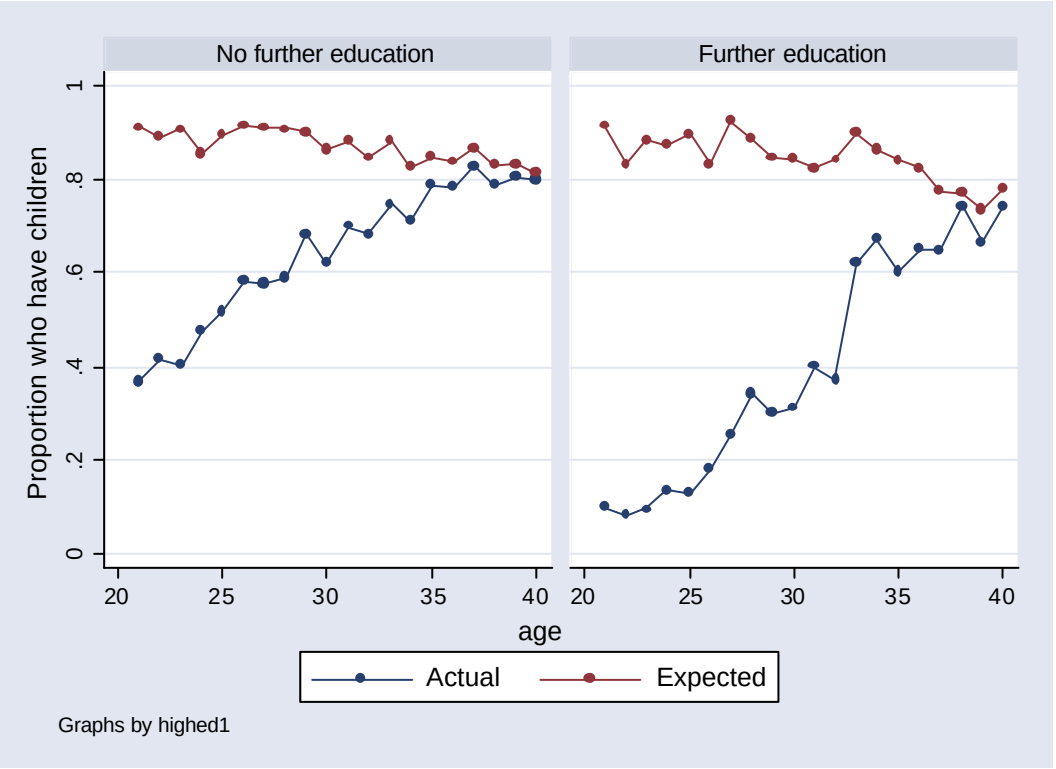
One set of issues concerns the consequences of the polarisation of the age of childbearing for the mothers and the children. Much of the evidence suggests that it is likely to lead to an amplification of the material advantages of better-educated mothers – both for themselves and for their children. Rake (2000) shows that the fertility penalty associated with childbirth typically falls with the age of childbirth, while Iacovou (2001) and Hawkes et al (2004) show that, controlling for a range of background variables, children with older parents are advantaged.

Finally, an obvious question to ask is the extent to which the second phase of falling fertility, reflecting rising childlessness is “involuntary”. As evidence on this, Figures 16 shows information on expectations and realisations of fertility, by age, for women with and without further education, revealing a far greater disparity between early expectations and subsequent realisations for educated women than for women with no further education. Of course, these figures should be interpreted with caution – they are derived from cross-section data, so expectations and realisations are not from the same women and the age profiles may combine age and cohort effects. Nevertheless, they show that, among young women, fertility expectations vary little by education – and, unless the fertility experiences of these young women are very different to those of their older counterparts, the two groups are likely to have very different experiences of fertility in practice.

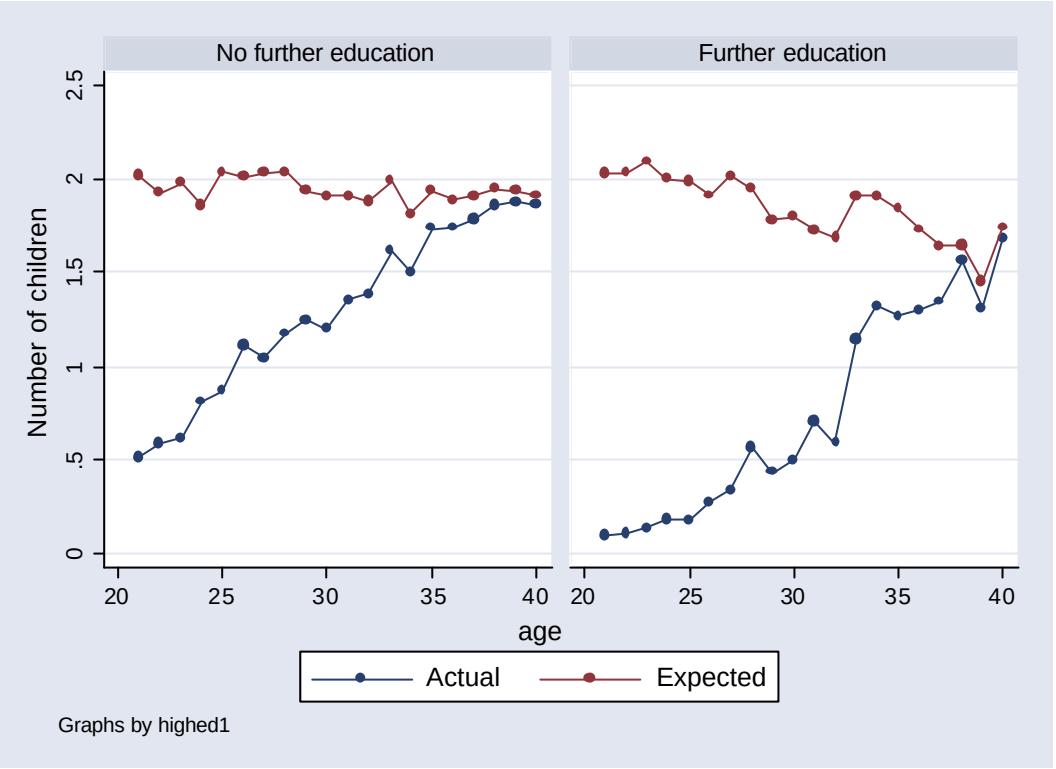
Figure 16

Expectations and realisations of fertility, by age and education

a. Having any children



b. Total number of children



Note: This information is taken from the General Household Survey – women are asked how many children they expect to have, including the ones they already have.

What is interesting is that these differences in expectations and realisations are in spite of the fact that more college-educated women combine full-time work and motherhood than women who leave school at 16. The ability to combine work and children is clearly linked to fertility – those college-educated women who were born in the early 1950s, many of whom appear to have made a choice, experienced even lower fertility than later cohorts. The rise in full-time employment among educated women with children suggests that fewer of them today appear to need to make a choice, but if they are, they are less likely than school-leavers to choose children.

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Appendix: Impact of the age threshold on the probability of giving birth

Each row gives the estimated coefficient on age at interview from running a (pooled) regression of the probability of giving birth at (different) younger ages. We also report the number of individual cohorts that "fail" at each age threshold – defined as the coefficient being significant in a separate regression for that cohort. These regression results are used as the basis for excluding information on women aged 38 and over.

Age Threshold	P(16)	# cohorts fail	P(17)	# cohorts fail	P(18)	# cohorts fail	P(19)	# cohorts fail	P(20)	# cohorts fail
33	-0.0003 (0.0004)	0	-0.0004 (0.0008)	0	-0.0005 (0.0012)	0	-0.0092 (0.0015)	0	-0.0081 (0.0018)	0
34	-0.0008 (0.0004)	0	-0.0012 (0.0008)	0	-0.0010 (0.0011)	0	-0.0091 (0.0014)	0	-0.0014 (0.0017)	0
35	-0.0012*** (0.0004)	0	-0.0019** (0.0008)	0	-0.0023** (0.0011)	0	-0.0022 (0.0014)	0	-0.0022 (0.0017)	0
36	-0.0015*** (0.0004)	0	-0.0031*** (0.0007)	0	-0.0039*** (0.0011)	0	-0.0036*** (0.0014)	0	-0.0030 (0.0016)	0
37	-0.0018*** (0.0004)	1	-0.0041*** (0.0008)	3	-0.0058*** (0.0011)	0	-0.0056*** 0.0014	0	-0.0047*** (0.0016)	0
38	-0.0020*** (0.0004)	2	-0.0051*** (0.0007)	5	-0.0075*** (0.0011)	1	-0.0079*** (0.0013)	0	-0.0070*** (0.0016)	0
39	-0.0023*** (0.0004)	3	-0.0061*** (0.0007)	6	-0.0095*** (0.0010)	7	-0.0104*** (0.0013)	3	-0.0100*** (0.0016)	2
40	-0.0026*** (0.0004)	5	-0.0070*** (0.0060)	8	-0.0113*** (0.0010)	11	-0.0129*** (0.0013)	7	-0.0132*** (0.0015)	4

Notes: standard errors in brackets, (***) (**) (*) denote significance at the 1% , 5% and 10% level respectively.