CPC
CENTRE FOR POPULATION CHANGE

CONNECTING GENERATIONS

Understanding fertility trends in Britain: Do fertility intentions differ across England, Wales and Scotland?

105 WORKING PAPER APRIL 2023

Ann Berrington
Bernice Kuang
Sarah Christison
Hill Kulu

Producing novel science
Informing policy
Improving knowledge on population change

cpc.ac.uk
ISSN 2042-4116

UKRI Economic and Social Research Council

ABSTRACT

This paper has three aims: Firstly, to review recent evidence collected within the vital registration system to identify how childbearing trends differ between Scotland, England and Wales; secondly, to use nationally representative survey data to identify how family size distributions changed during the period when the overall level of fertility diverged between the countries; and thirdly, to establish whether fertility intentions are different in the British nations and hence whether this could be an explanation for differences in behaviour. We find:

- Fertility in Britain fell to an historically low level in 2020.
- Since the late 1970s, Scotland has consistently recorded significantly lower levels of fertility than England and Wales.
- The difference appears to be due to lower rates of childbearing among women in their thirties and forties in Scotland as compared to England.
- Some, but not all of the difference can be attributed to higher fertility among foreign-born women in the UK. Fertility of UK-born women in Scotland is lower than UK-born women in England and Wales.
- Survey data on fertility intentions show that there are no differences in intentions to have a first birth. However, Scottish (and Welsh) mothers are less likely to have a firm intention to have additional births.
- Analysis of fertility by age, parity and duration since last birth is critical to understand differences in childbearing behaviour between Scotland and England and Wales.
- Analyses using large census-linked longitudinal datasets such as the ONS Longitudinal Study and the Scottish Longitudinal Study are required.

KEYWORDS

Fertility intentions; childbearing intentions; fertility desires; ideal family size; Scotland; England; Wales.

EDITORIAL NOTE

Ann Berrington is a Professor of Demography and Social Statistics at the University of Southampton and jointly co-ordinates the fertility and family strand of the ESRC Centre for Population Change.

Bernice Kuang is a Research Fellow at the University of Southampton, working on fertility and family change.

Sarah Christison is a Research Fellow at the University of St Andrews, working within the fertility and family strand of the ESRC Centre for Population Change.

Hill Kulu is a Professor of Human Geography and Demography at the University of St Andrews, and Co-Director of the ESRC Centre for Population Change Connecting Generations.

Corresponding author: Ann Berrington, A.Berrington@soton.ac.uk

ACKNOWLEDGEMENTS

This work was supported by the ESRC award: Understanding Recent Fertility Change in the UK Grant ES/S009477/1. The authors are grateful for comments and suggestions from the other members of the project team. The authors are grateful to the UK Data Service for providing access to and clearance for outputs from our analyses of data from Ní Bhrolcháin, M., Berrington, A., Falkingham, J. (2016). Centre for Population Change General Household Survey Database, 1979-2009: Secure Access. [data collection]. Office for National Statistics, Social Survey Division, [original data producer(s)]. Office for National Statistics, Social Survey Division. SN:8099, DOI: 10.5255/UKDA-SN-8099-1

© Ann Berrington, Bernice Kuang, Sarah Christison, Hill Kulu all rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

ESRC Centre for Population Change
Connecting Generations

The ESRC Centre for Population Change (CPC) is a joint initiative between the Universities of Southampton, St Andrews and Stirling, in partnership with the Office for National Statistics (ONS) and the National Records of Scotland (NRS).

Connecting Generations (CG) is a major strategic collaboration between CPC, the Leverhulme Centre for Demographic Research (LCDM) at the University of Oxford, and the Resolution Foundation.

The Centre is funded by the Economic and Social Research Council (ESRC) grant numbers RES-625-28-0001, ES/K007394/1, ES/R009139/1 and ES/W002116/1.

This working paper series publishes independent research, not always funded through the Centre. The views and opinions expressed by authors do not necessarily reflect those of the CPC, CG, ESRC, ONS or NRS.

The ESRC Centre for Population Change Working Paper Series is edited by Teresa McGowan; t.mcgowan@southampton.ac.uk

UNDERSTANDING FERTILITY TRENDS IN BRITAIN: DO FERTILITY INTENTIONS DIFFER ACROSS ENGLAND, WALES AND SCOTLAND?

TABLE OF CONTENTS

1. INTRODUCTION 1

2. TRENDS IN PERIOD AND COHORT FERTILITY ACROSS BRITAIN 2

2.1 PERIOD FERTILITY TRENDS 2

2.2 COHORT FERTILITY – COMPLETED FAMILY SIZE 6

2.3 FAMILY SIZE DISTRIBUTIONS IN SCOTLAND AND ENGLAND AND WALES 8

3. ARE THERE DIFFERENCES IN FERTILITY INTENTIONS AMONG WOMEN IN SCOTLAND, WALES AND ENGLAND? 10

3.1 FERTILITY INTENTION QUESTIONS IN THE GENERAL HOUSEHOLD SURVEY 10

3.2 DESCRIPTIVE FINDINGS 11

3.3 TO WHAT EXTENT ARE CROSS-NATIONAL DIFFERENCES EXPLAINED BY POPULATION COMPOSITION? 14

3.3.1 MULTINOMIAL REGRESSION OUTCOME 15

3.3.2 POPULATION COMPOSITION CONTROLS 15

3.3.3 MODELLING STRATEGY 17

3.3.4 RESULTS 17

4. DISCUSSION 25

REFERENCES 27

1. INTRODUCTION

Since the late 1970s, fertility rates have tended to be lower in Scotland, than in England or Wales and the gap has increased over time. In 2021 period fertility rates implied an average for Scotland of 1.31 children per woman, as compared to 1.49 in Wales and 1.62 in England (ONS, 2022a, NRS, 2022a). The Scottish Government have expressed concern about these persistent low levels of fertility and have put in place a population strategy which aims to remove barriers to childbearing, for example by committing to building more affordable homes, providing additional childcare places, and introducing the Scottish Child Payment (Scottish Government, 2021). This population strategy implicitly assumes that Scottish adults would have more children if the conditions were favourable. The strategy draws on previous work suggesting that women in Scotland appear to be less likely to have larger families (more than 2 children) than English women and have longer birth intervals (Graham et al., 2007). This previous work also suggested that the differences between Scotland and England are not due to England having a larger immigrant and ethnic minority population as the differences remain when excluding women born outside of the UK and excluding ethnic minorities (General Register office for Scotland, 2008). However, the previous work is more than a decade old. This study provides some key evidence about the differences in childbearing in Scotland and in England and Wales.

Whilst there remains a two-child norm in most European countries there is evidence that younger generations are increasingly desiring fewer children, and more likely to intend to remain childless or to have just one child (Sobotka & Beaujouan, 2014). It is unclear whether Scottish women desire fewer children, or whether their fertility intentions are similar to women living in England and Wales, but that the gap between fertility intentions and achieved fertility is greater in Scotland. In Britain, fertility intentions have been shown to be useful predictor of fertility behaviour, though both men and women tend to end up having fewer children than they originally intended (Berrington, 2004). Cross-national comparison suggests that women are more likely to remain childless than originally intended, and that this gap between intended and achieved fertility is most apparent in Southern Europe and the German-speaking countries and smallest in Central and Eastern European countries (Beaujouan & Berghammer, 2019).

The purpose of this paper is three-fold: Firstly, to review recent evidence collected within the vital registration system to identify how childbearing trends differ between Scotland, England and Wales; secondly, to use nationally representative survey data to identify how family size distributions changed during the period when the overall level of fertility diverged between the countries; and thirdly, to establish whether fertility intentions are different in the British nations and hence whether this could be an explanation for differences in behaviour.

2. TRENDS IN PERIOD AND COHORT FERTILITY ACROSS BRITAIN

Trends and patterns in childbearing can be examined from a period or cohort perspective. Period trends in fertility tell us about fluctuations in birth rates from one year to the next. The Total Fertility Rate (TFR) is often used as a summary measure of the overall level of childbearing but its interpretation is made complex by the fact that period trends in fertility are affected by the timing of childbearing as well as the number of children. For example, period fertility can fall due to the postponement of childbearing to later ages and rise once again later on if cohorts recuperate their fertility at later ages. Cohort trends in completed family size fluctuate much less over historical time but can only be calculated once a cohort has reached the end of the reproductive life span and reflect changes in the number of children ever born. It is instructive therefore to examine differences between the nations in terms of trends in both period and cohort fertility.

2.1 PERIOD FERTILITY TRENDS

Figure 1 shows the period TFR for the countries of Britain between 1971 and 2021. All the countries followed the same trend – a decline in fertility during the 1970s, a slight recovery in the late 1970s before being more stable during the 1980s and 1990s. Then, during the 2000s there was a sustained increase in fertility followed by a significant decline from 2010 onwards. This decline appears to have accelerated in 2020 as a result of lower conceptions taking place during the early phases of the Covid-19 pandemic, with a subsequent recovery in 2021. Prior to the late 1970s, Scotland's TFR was slightly above that of Wales and England. However, fertility rates continued a slow decline right through the 1980s and 1990s such that by 2000 there was a significant

difference. Today, the TFR in Scotland is considerably closer to many other European countries; the average TFR across all EU countries in 2020 was 1.5 births per woman (Eurostat, 2022), whereas the TFR for the rest of Britain is relatively high in a European context. Up until 2000, the TFR in Wales had generally been above that of England. From 2000, onwards the TFR for Wales began to decline slightly more than for England.

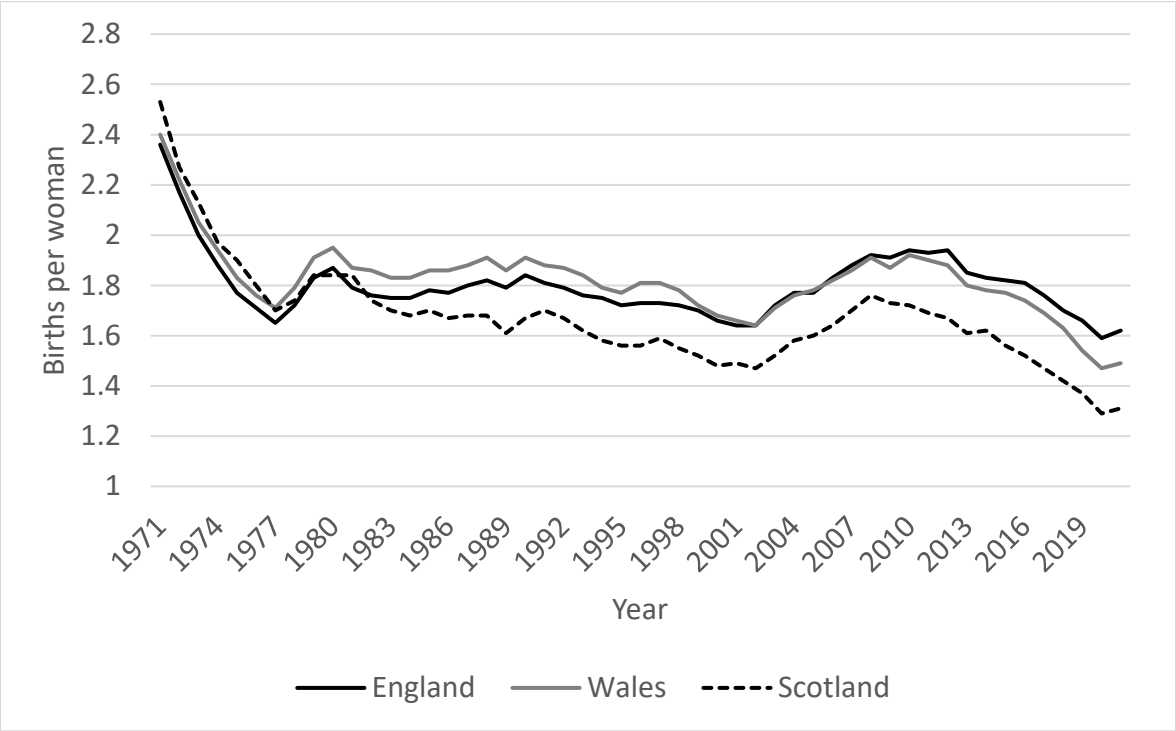


Figure 1: Period TFR 1971-2021, countries of Britain
Source: ONS (2022a), NRS (2022)

The age pattern of childbearing has changed markedly in all countries of Britain, most notably the postponement of childbearing to later ages. Figure 2 compares the age specific fertility rates (ASFRs) in England and Wales, and in Scotland for the past five decades. The major trend for both countries is a decline in fertility rates to women aged under 30 and an increase, at least until around 2011, in fertility rates among older women. In both countries teenage fertility has fallen dramatically, especially in the last decade when the level reduces from about 21 births per thousand women to around 8 births per thousand women. At the same time rates of childbearing to women in their forties have tripled, albeit from a low base. Consistent with the higher TFR in Scotland in

the 1970s (Figure 1) we can see that fertility rates in 1971 were higher in Scotland at most ages. Subsequently, in Scotland fertility rates at younger ages fell faster than was the case for England and Wales, and rates for those aged 30-34 and 35-39 did not increase as much in Scotland. In other words, Scotland experienced a greater level of fertility postponement over the past five decades and less fertility recuperation at older ages.

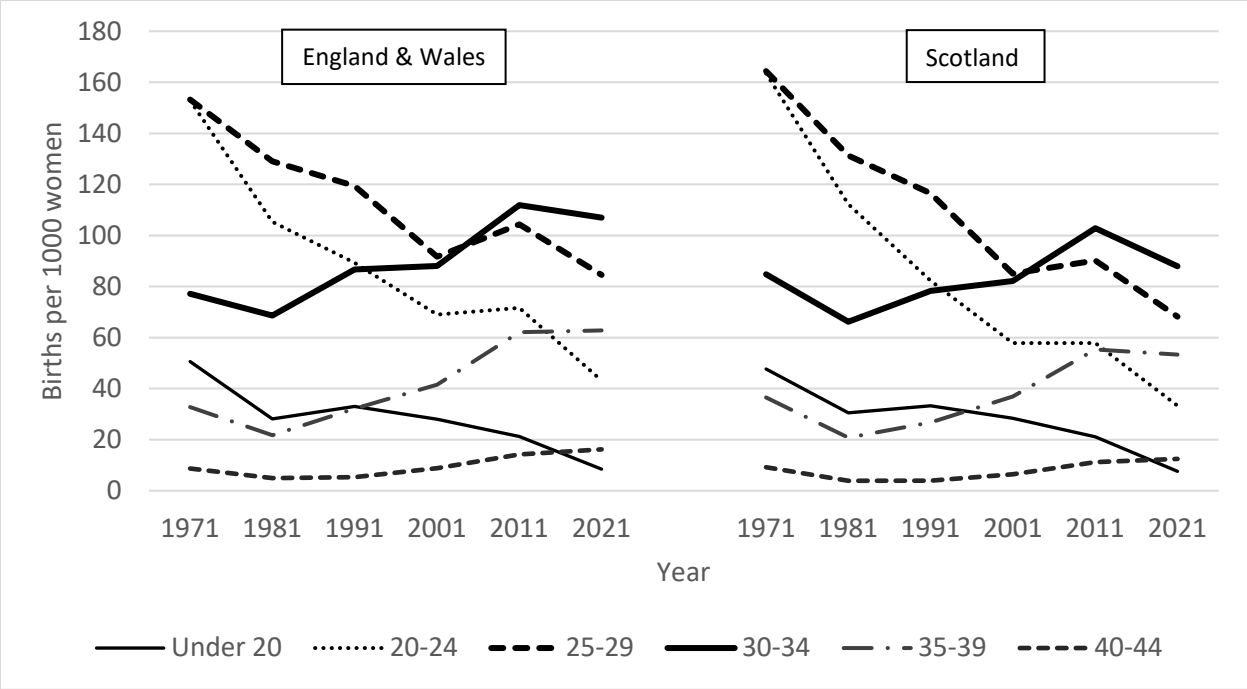


Figure 2: Age Specific Fertility Rates (ASFRs) 1971-2021, England & Wales, and Scotland
Source: ONS (2022a), NRS (2022)

The proportion of births occurring to women who are born outside of the UK is significantly higher in England and Wales at 29% in 2021 (ONS, 2022b) as compared with Scotland at 17% in 2021 (NRS, 2022). It is reasonable to ask the question therefore as to whether the higher overall level of fertility in England and Wales is due to higher rates of childbearing among immigrant women. ONS makes estimates of ASFRs by country of birth for women resident in the different countries of the UK (ONS, 2022c). Births by country of birth of the mother are available from vital registration and used as the numerator. Estimates of the female population by 5-year age-group broken down by country of birth (UK or non-UK) from the Annual Population Survey are used for the denominators. Estimates are available from 2004 until 2020. In 2004 birth rates to foreign-born

women were higher than UK-born women in both Scotland and England and Wales, although the TFR for foreign-born women in Scotland was 2.00 as compared to 2.46 in England and Wales (Table 1). By 2020 birth rates had fallen, but particularly so among foreign-born women. Moreover, in Scotland, in 2020, birth rates to foreign born women were lower (TFR 1.23) than that of the UK-born population (TFR 1.31).

	2004			2020		
	UK-born women	Foreign-born women	All women	UK-born women	Foreign-born women	All women
England and Wales	1.67	2.46	1.78	1.49	2.03	1.60
Scotland	1.56	2.00	1.59	1.31	1.23	1.30

Table 1: Estimated Total Fertility Rate According to Whether Born in the UK or not. England and Wales, and Scotland, 2004 and 2020.
Source: ONS (2022b), ONS (2022c)

Figure 3 below shows the very different age pattern of childbearing among UK-born (on the left) and non-UK born (on the right) women in England and Wales and in Scotland. If we focus on UK-born women we can see that the age pattern of fertility is similar in both areas, but the level is slightly lower in Scotland. However, if we look at the ASFRs for non-UK born women we see a very different pattern in Scotland as compared to England and Wales. In particular, fertility rates to women in their early and mid-twenties are much higher among foreign-born women in England and Wales.

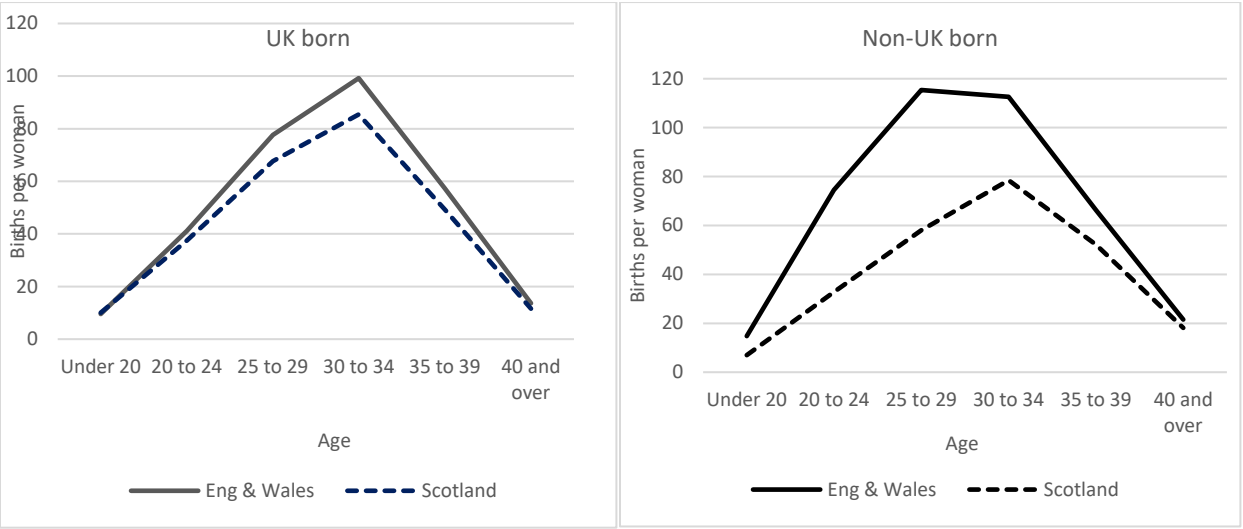


Figure 3: Age specific fertility rates for a) UK born and b) Non-UK born women in England and Wales and in Scotland, 2020
Source: ONS (2022b), ONS (2022c)

These fertility differences relate to the different composition of foreign-born women in the two countries, for example in terms of country of origin, reason for migration. As noted by Robards and Berrington (2016) birth rates in the five years subsequent to arrival in England and Wales were highest among those born in Pakistan and Bangladesh, and lower among those arriving from India and Poland.

In sum, it is likely that a small part of the difference in fertility rates between England and Wales and Scotland is due to higher rates of international migration to England and Wales. However, if we just focus on UK born women, we can see that fertility rates remain higher for women resident in England and Wales than in Scotland.

2.2 COHORT FERTILITY – COMPLETED FAMILY SIZE

Cohort fertility or completed family size is only available for women who have reached age 45 and hence the end of their reproductive lifetime. Figure 4 shows that, in general, completed family size decreased for women born between the mid-1950s and mid-1970s, particularly in Scotland. For more recent birth cohorts, completed family size has remained stable in Scotland at about 1.75 births per woman, whilst in England and Wales, completed family size increased slightly for

women born in the late 1970 and thus in England and Wales, cohort fertility is currently only just below replacement level (i.e. the level required for one generation to replace the previous one in the absence of migration: 2.1 births per woman) at 1.94. These data are consistent with the notion that whilst both Scotland and England & Wales experienced a postponement transition – i.e. births were delayed to later ages, the recuperation of births at older ages has been greater in England and Wales such that completed family size has not decreased by as much as is the case in Scotland.

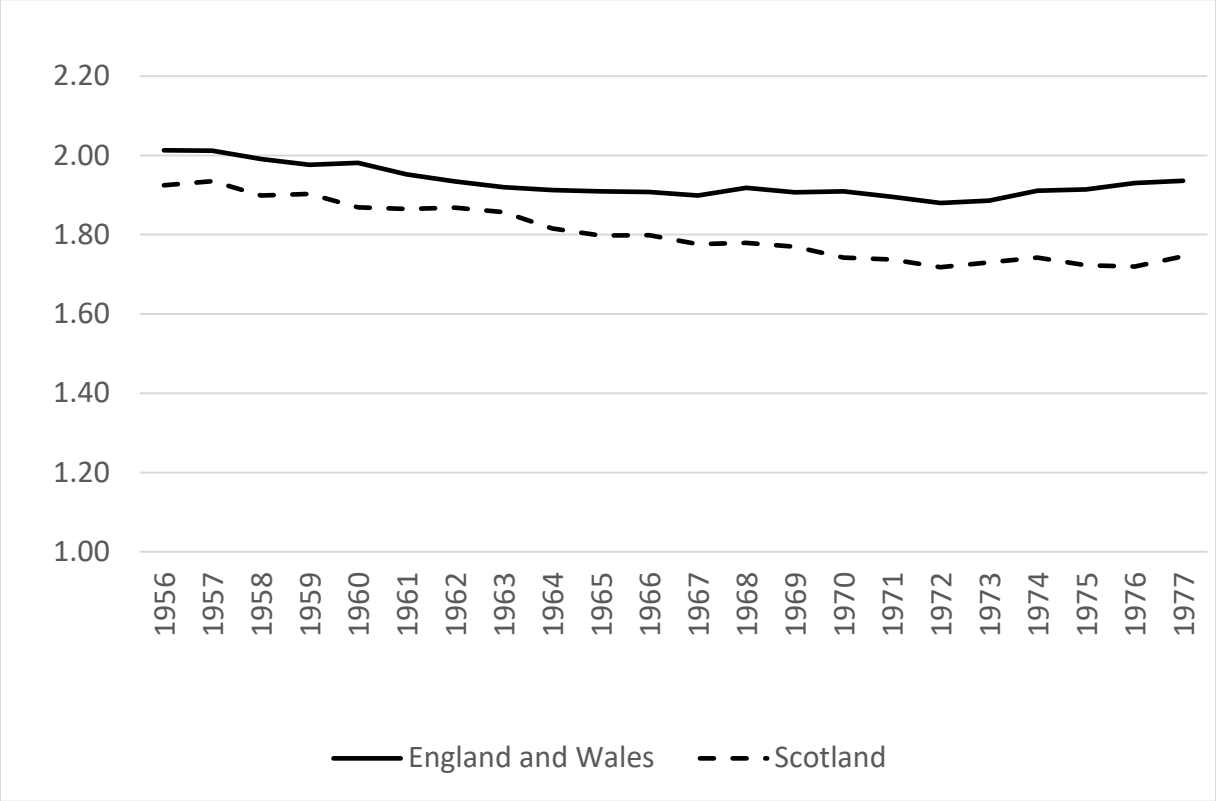


Figure 4: Average completed family size, birth cohorts 1956-1977.

The data available from vital registration for Scotland do not provide any information about the distribution of family size. In other words, from vital registration data we cannot tell whether the smaller family size in Scotland is due to more women remaining childless, more having just one child, or fewer having larger families. In the following section we use survey data to estimate family size distributions for Scotland and for England and Wales. Although this type of analysis has been conducted before (Chamberlain & Smallwood, 2004; Graham et al., 2007), we use a

larger dataset, covering a long time period, which has been constructed by harmonising and combining many years of General Household Survey data.

2.3 FAMILY SIZE DISTRIBUTIONS IN SCOTLAND AND ENGLAND AND WALES

The General Household Survey, later renamed General Lifestyle Survey (GHS), was for many years the only Government survey which routinely collected retrospective data on fertility and partnership histories from women. The survey was not fielded after 2011 (ONS, 2013). This paper utilizes a time series dataset which has harmonized fertility and partnership data from 1979-2009 (Beaujouan et al., 2014) and has augmented the births reported in the fertility histories with children reported living in the household using an own child method. Thus, we consider these estimates to be the best available for this period (Ní Bhrolcháin et al., 2011).

We use the reports of women aged 40-44 in the GHS in the years 1979 to 2009 to examine cohort changes in completed family size in Britain (Table 2). The data are consistent with those plotted in Figure 4. Among women born in the 1930s and 1940s, those in Scotland reported a slightly larger family size (although the difference is not significant at the 5% level due to sample size issues). For women born in the 1950s and 1960s average family size was smaller in Scotland, though again, differences are insignificant at the 5% level.

	England	**Wales**	**Scotland**
1930s	2.44 [2.38-2.50]	2.53 [2.29-2.77]	2.58 [2.39-2.77]
1940s	2.22 [2.18-2.25]	2.45 [2.33-2.58]	2.32 [2.23-2.41]
1950s	2.07 [2.03-2.10]	2.06 [1.91-2.22]	2.00 [1.90-2.11]
1960s	1.98 [1.94-2.03]	1.93 [1.75-2.12]	1.91 [1.77-2.06]

Table 2: Average completed family size birth cohorts 1930s-1960s [95% CI]. Calculated for women aged 40-44 in General Household Surveys 1979-2009
Source: Authors' analysis of CPC Harmonised GHS datasets

Table 3 shows the distribution of family sizes by country and cohort. Small sample sizes within each country cohort mean that differences are not statistically significant but there are some patterns consistent with analysis of fertility histories from the British Household Panel Survey (Graham et al. 2007). Differences are fairly small, but there is some evidence that childlessness

has increased more among Scottish women, and the proportion with three or more children has declined more steeply across cohorts born 1930 to 1969. For example, among women born in the 1960s 15% of women living in England reported themselves to be childless, as compared to 17% for those living in Wales and Scotland. Among Scottish women born in the 1930s, half had at least three children, but for those born in the 1960s this proportion had fallen to 27% (lower than the figure for England: 30%). Small sample sizes mean that these differences are not statistically significant. Larger datasets, for example, based on births linked to census longitudinal surveys are required to fully understand trends by parity and how they differ across the countries of Britain.

England	**0**	**1**	**2**	**3+**
1930s	0.104	0.128	0.344	0.424
	[.0927,.117]	[.1153,.1425]	[.3248,.3629]	[.404,.444]
1940s	0.106	0.131	0.418	0.345
	[.099,.1138]	[.1228,.1393]	[.4065,.4304]	[.3331,.3564]
1950s	0.134	0.149	0.408	0.309
	[.1249,.1442]	[.139,.1589]	[.3939,.4221]	[.2958,.3228]
1960s	0.150	0.162	0.392	0.297
	[.1377,.1621]	[.1506,.175]	[.3749,.4083]	[.2808,.3129]
Wales	**0**	**1**	**2**	**3+**
1930s	0.084	0.099	0.367	0.450
	[.0478,.1426]	[.0604,.1593]	[.2906,.4499]	[.3693,.5338]
1940s	0.07	0.11	0.40	0.42
	[.0497,.097]	[.0807,.1384]	[.3551,.4499]	[.3749,.4716]
1950s	0.128	0.139	0.430	0.303
	[.0936,.1722]	[.1044,.1829]	[.3724,.4891]	[.2517,.3603]
1960s	0.173	0.163	0.357	0.307
	[.1259,.2337]	[.1187,.2194]	[.2936,.4258]	[.2468,.3743]
Scotland	**0**	**1**	**2**	**3+**
1930s	0.095	0.126	0.280	0.499
	[.0636,.139]	[.0909,.1726]	[.2299,.3372]	[.438,.5592]
1940s	0.075	0.123	0.412	0.390
	[.0584,.0956]	[.1012,.1493]	[.3766,.4487]	[.3546,.426]
1950s	0.125	0.157	0.441	0.278
	[.0992,.1554]	[.1279,.1912]	[.3974,.4845]	[.2401,.3191]
1960s	0.174	0.137	0.418	0.272
	[.1384,.2159]	[.1046,.1769]	[.3664,.4709]	[.2261,.3227]

Table 3: Family size distribution by country and birth cohort 1930s-1960s. Calculated for women aged 40-44 in General Household Surveys 1979-2009. Proportions [95% CI]
Source: Authors' analysis of CPC Harmonised GHS datasets

3. ARE THERE DIFFERENCES IN FERTILITY INTENTIONS AMONG WOMEN IN SCOTLAND, WALES AND ENGLAND?

There is debate as to the extent to which reported childbearing intentions have genuine predictive validity, or whether fertility intentions are continuously amended across the life course, according to individuals' circumstance (see Berrington 2021). Nevertheless, much recent attention has been paid to understanding the gap observed between intended and observed fertility in high income countries. Brinton and colleagues (2018) refer to an 'unmet demand for children'. If we accept that intentions do have some predictive power on childbearing behaviour (Berrington, 2004), we might question whether the smaller family size in Scotland reflects different childbearing intentions, or whether intentions are similar across the countries of Britain, but that for some reason individuals are less likely to achieve their intentions in Scotland.

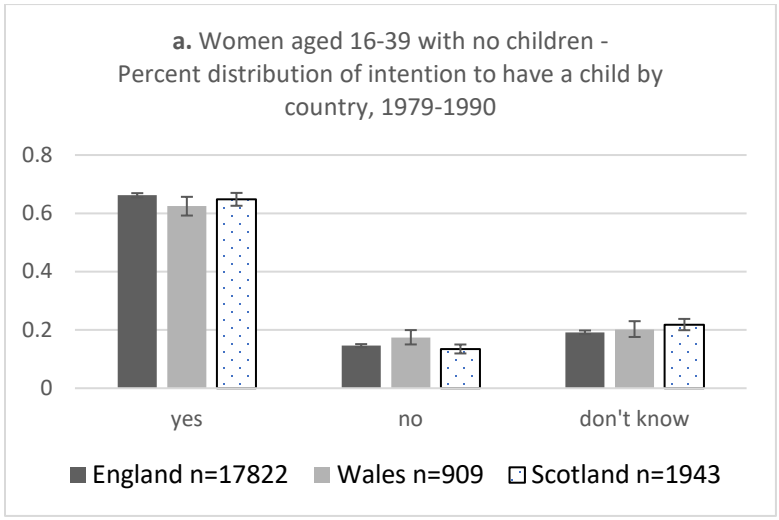
3.1 FERTILITY INTENTION QUESTIONS IN THE GENERAL HOUSEHOLD SURVEY

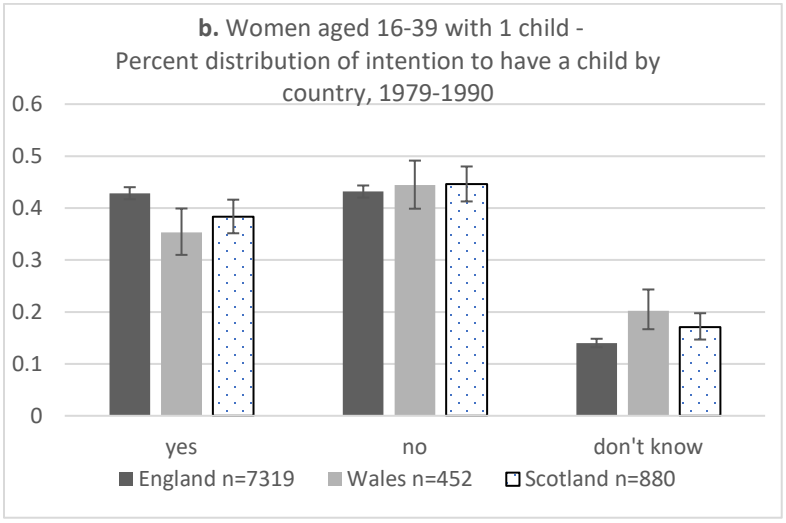
The General Household Survey (1979-2009) asked respondents about their fertility intentions, posing the question "Do you think that you will have any (more) children?[1] In the first decade when this question was asked, a significant minority of women were answering "don't know", so the question was updated in 1991 such that the response categories now included "probably yes" and "probably no", in addition to "yes", "no" and "don't know" (Ni Bhrolchain et al. 2010). In the following analysis, we split the data into two time periods (1979-1990) and (1991-2009) corresponding to the change in response categories. Given that childbearing decisions are made sequentially, we stratify the analyses according to current parity i.e. the number of previous live births. We consider women aged 16-39 as these women are more likely to have time to become pregnant in the future, compared with women over 40. All of the following results pertain to 97,581 women whose parity and fertility intentions are known.

[1] Women who are currently pregnant were asked whether they "intend to have any more children after the one you are expecting?"

3.2 DESCRIPTIVE FINDINGS

Figure 5(a-c) shows fertility intentions according to country of residence for the period 1979-1990. 95% confidence intervals are also shown to give an indication as to whether differences across countries are statistically significant. Panel (a) refers to childless women, (b) to women who have had one live birth, and (c) women who have had a least two live births. Figure 6(a-c) groups women according to parity in the same way, but for the period 1991-2009 when the response categories were expanded to include “probably yes” and “probably no”.





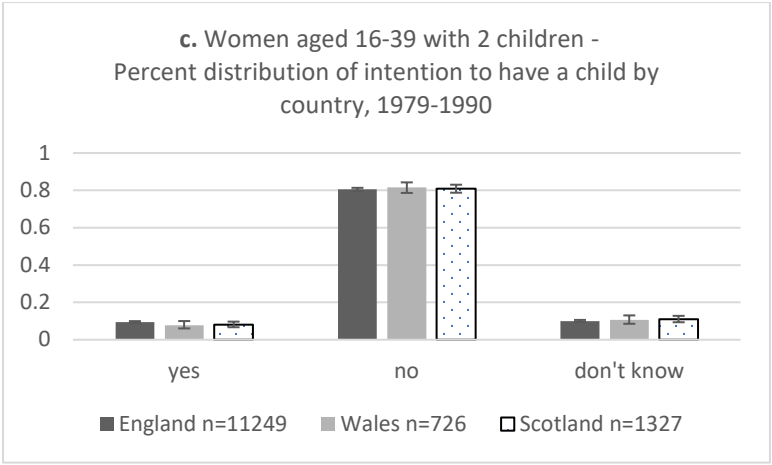


Figure 5: Fertility intentions by country and current parity. Women aged 16-39 in 1979-1990.
Source: Authors' analysis of CPC Harmonised GHS datasets

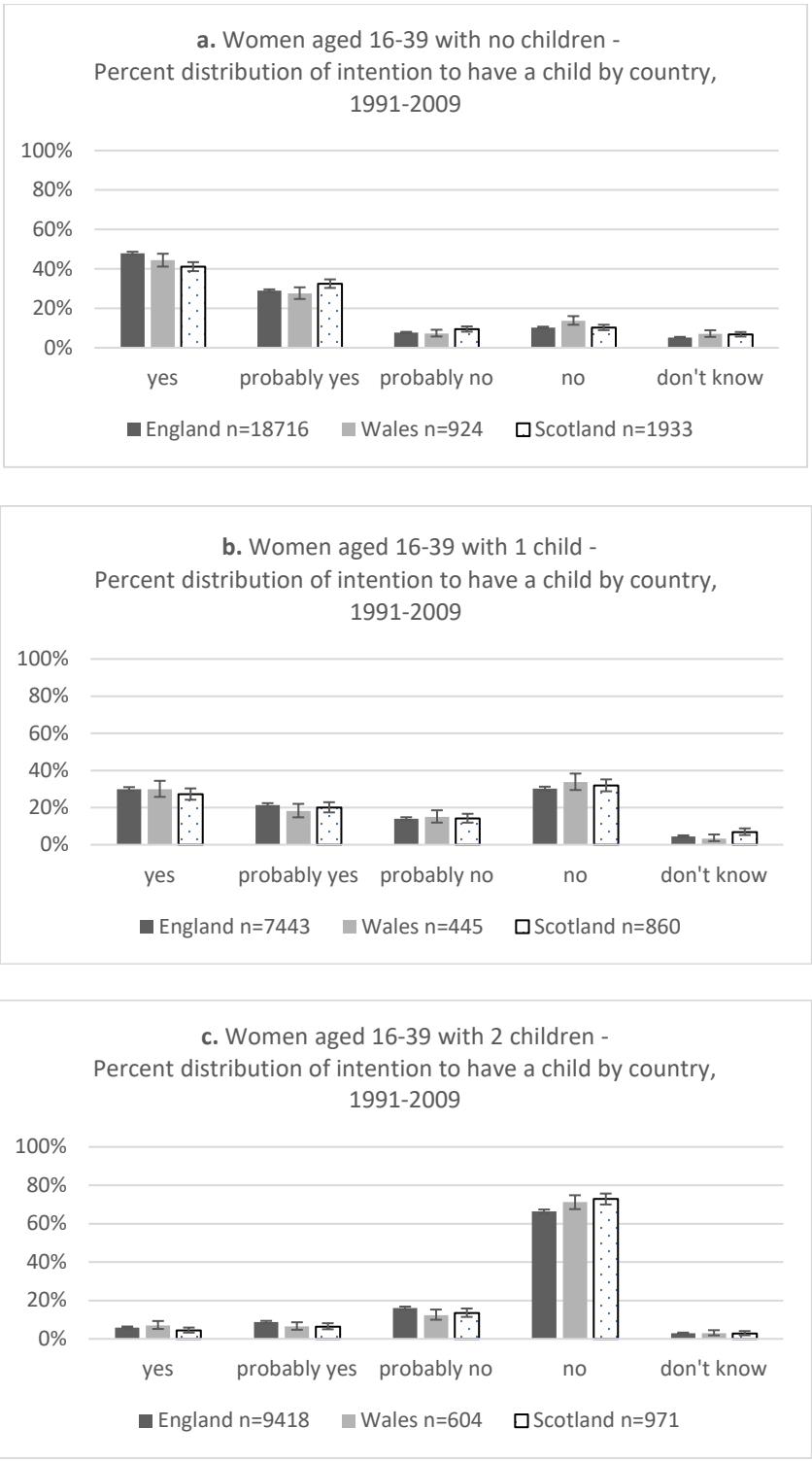


Figure 6: Fertility intentions by country and current parity. Women aged 16-39 in 1991-2009.
Source: Authors' analysis of CPC Harmonised GHS datasets

As would be expected, the percentage who say "yes"- that they intend to have a(nother) child - are highest for childless women and lowest for those with two or more children and the opposite is seen for the percentage who say "no". In the earlier time period (1979-1990) a significant minority of women were uncertain about their intention: For example, among women with one child, 14%, 20% and 17% of women in England, Wales and Scotland respectively said they "did not know" whether they would have another child. The introduction of the new-style question in 1991 reduced by more than half the proportion of women giving an uncertain response and the answers provide a more nuanced understanding of the ambiguity of fertility intentions with many women reporting "probably yes" and "probably no".

In terms of country comparisons, overall, intentions are relatively similar across the nations. However, there are some small but statistically significant differences whereby women in Wales and Scotland are slightly less likely to intend to have an additional birth and are more likely to either indicate that they are uncertain, or that they do not want an additional birth. The differences between Scotland and England are greater in the more recent period, and are strongest for women who already have at least one child. For exampe, in the period 1991-2009, among those with two or more children, 77% and 75% of mothers in Scotland and Wales said "no" they did not intend to have an additional child as compared to 71% in England ($p<0.05$). (Note that the difference is similar if we just focus on those with exactly two children (data not shown in Figure) where the percentages for the countries would be 73%, 71% and 66% ($p<0.05$).

Whilst some of our sample sizes are relatively small, it is clear that there is a pattern, across both the time periods and parities, for intentions to be more positive among women living in England. The following section uses regression analysis to see whether these differences remain once the demographic and socio-economic composition of the countries is taken account of.

3.3 TO WHAT EXTENT ARE CROSS-NATIONAL DIFFERENCES EXPLAINED BY POPULATION COMPOSITION?

In this section we ask whether the differences in fertility intentions found between the countries of Britain are explained by differences in the population composition of the countries. Past research

has highlighted how childbearing in the UK is affected by partnership status (Berrington & Pattaro, 2014), level of education (Berrington et al., 2015), employment status (Berrington & Pattaro, 2014), housing tenure (Tocchioni et al., 2021), country of birth (Kulu et al., 2017) and ethnicity (Kulu & Hannemann, 2016). It is thus important to control for these variables to see if the cross-national differences are attenuated.

3.3.1 MULTINOMIAL REGRESSION OUTCOME

We treat fertility intentions as a nominal outcome and use multinomial logistic regression models to predict intentions for women at each parity, disaggregated by time period. The log odds of the outcome are modeled as a linear combination of the predictor variables.

The baseline category is "no" – the respondent does not intend to have a(nother) child.

3.3.2 POPULATION COMPOSITION CONTROLS

Partnership status: Those who are currently living with a partner will be more likely to have positive fertiltiy intentions, whilst those unpartnered will be less certain (Berrington & Pattaro, 2014). Married couples are likely to be the least uncertain in their intention as their situation is likely to be most stable. In the analysis we code current partnership status as either unpartnered, cohabiting or married. *Highest educational qualification:* Higher levels of education are associated with a delay in childbearing. However, past reserch suggests that in young adulthood, fertility intentions do not differ that much by education but that it is those with degree level education who are the least likely to achieve these intentions (Berrington & Pattaro, 2014). There is likely to be a selection into parenthood among those with higher education such that women who are most family orientated will have already have a child. Thus, it is possible that we see a positive relationship between level of education and intentions among mothers (Kravdal, 2001). In the following analyses we code respondents according to whether they report: no qualifications; foreign qualifications, GCSEs, O levels and CSEs - qualifications typically achieved at age 16; advanced qualificaitons such as A levels typically achieved at age 18; and degree level qualifications.

Employment status: Other things being equal the economic opportunity costs of childbearing are higher for women who are in paid employment outside the home (Becker, 1981). Thus we expect intentions to be more positive among those not currently in paid work. We differentiate the latter according to whether they are unemployed or economically inactive and expect childbearing intentions to be more positive among the latter as they are not seeking work.

Housing Tenure: Most research suggests that childbearing intentions are higher among those who are in the privileged position of having bought their own home since these people will be more stable in their housing situation (Vignoli et al., 2013). Historically in the UK, socially rented housing has also provide a secure tenure for those on low incomes (Murphy & Sullivan, 1985), though the availability of social housing has reduced markedly over the decades investigated here. Private renting is the least secure tenure and we might expect private renters to postpone their childbearing until a more stable housing situation can be found (Tocchioni et al., 2021).

Country of birth: The relationship between international migration and fertility is complex and dependent upon numerous factors including reasons for migration and the typical levels of childbearing in the sending country (Kulu et al., 2017). It is often the case that fertility rates are higher following a migratory move, especially if the reason for moving is family formation (Robards and Berrington, 2016). The TFR for foreign-born women has for most years exceeded that of UK born women (ONS, 2022b) and thus it could be that the higher fertiltiy rates of England result from the greater number of international migrants. Due to sample size constraints we are only able to distinguish between women born in the UK; those born in -EU and Ireland, and those born elsewhere in the World. Based on previous research, we anticipate that the latter group will have more positive fertility intentions.

Ethnicity: In the UK ethnic minorities are increasingly made up of the second (and higher) generations born in the UK. Thus ethnicity captures a different demographic than country of birth. In general the fertility rates of the UK born second generation are closer to the UK average than the fertility of contemporary immigrants from the same ethnic group, suggesting evidence of

assimilation (Dubuc, 2012). However, in the period covered by these surveys it remained the case that fertility rates were higher among UK-born ethnic minorities – particularly those of Pakistani and Bangladeshi descent who have been seen to be more likely to have second, third and higher order births (Kulu & Hannemann, 2016). Due to sample size constraints we are only able to distinguish between White women on the one hand, and women of colour on the other hand. This is clearly a very crude indicator of ethnicity. Nevertheless, we anticipate that the latter group will have more positive fertility intentions.

Current parity: We control for the number of children that a woman already has, since fertility intentions will be more positive among those with two children as compared to those who already have three or more.

3.3.3 MODELLING STRATEGY

For each analysis, we run two models. Model 1 includes the respondent's age, survey year, and country of residence, in order to assess country differences in fertility intentions. Model 2 introduces socio-economic controls – education, partnership status, employment, housing tenure, country of birth and ethnicity. The second model tells us whether country differences persist once we take into account possible differences in population composition. Since it is only among mothers that we saw some significant differences in intentions in the descriptive analyses (Section 3.2) we only include the results for women with 1 child (Tables 4 for 1979-1990 and 5 for 1991-2009) and 2+ children (Tables 6 for 1979-1990 and 7 for 1991-2009).

3.3.4 RESULTS

Model 1 in Table 4 tells us that, in the period 1979-1990, mothers with one child in Scotland and Wales were less likely to intend to have an additional child as compared with mothers of the same age in England. In the case of Wales, mothers with one child were also more uncertain as to whether they would have another child. For example, for the outcome "yes", swiching from living in England to living in Scotland is associated with a RRR of 0.74 ($exp^{-0.300}$). That is to say the odds of having a positive intention as compared to a negative intention in Scotland are only three

quarters of those in England and Wales. Whilst statistically significant this is a relatively small effect size as compared with the influence of age. The large negative coefficients associated with older ages tell us that the likelihood of intending another child among those with one child currently decreases rapidly with age. The relative risk ratio (RRR) associated with switching from age 15-24 to age 35-39 is 0.03 ($exp^{-3.504}$).

The association between fertility intentions and the socio-economic characteristics included in Model 2 in Table 4 are as we would expect based on past literature (Berrington & Pattaro, 2014): The odds of intending to have additional child(ren) are greater for those who have a partner (the effect is similar for those cohabiting and those married), graduates, those who are unemployed or economically inactive, women living in social housing, and those born outside of the UK. For example, being born outside the UK in countries other than Europe or Ireland is associated in a doubling of the odds of intending to have another child relative to not intending to have a child (RRR = 2.29).

For the more recent time period (1991-2009), when the outcome categories are expanded to include "probably yes" and "probably no" a slightly different finding emerges (Table 5). Whilst women of parity one living in Wales are significantly less likely to report "probably yes" than those living in England, no difference is seen for Scottish women. Instead mothers with one child living in Scotland are more likely to be uncertain in their intentions. Comparison of the estimates for Scotland from Model 1 and Model 2 suggests that controlling for the composition of the Scottish population does not diminish the greater likelihood ($p<0.05$) of Scottish women to be more uncertain in their intentions. The odds of responding "don't know" rather than "no" are 1.55 times higher for women in Scotland than in England. Once population composition is controlled, Scottish and Welsh women with a single child are not significantly less likely to say either "yes" or "probably yes".

The findings for the control variables for the more recent time period are similar to those reported for the earlier period. For example, older women are far less likely to report "yes" or "probably yes" and partnered women are far more likely than those without a partner to responded "yes or

probably yes". Whilst for the earlier time period ethnicity was not significantly associated with fertility intentions among women with one child, in the period 1991-2009, persons of colour were signficantly more likely to say "yes or probably yes".

The control variables are as one would expect with intentions to have a third or subsequent birth being more positive among younger, partnered, economically inactive women. Women who have degree level qualifications, those renting their home (as opposed to being an owner occupier), those who were born outside of the UK in the rest of the world, and women of colour are significantly more likely to have positive intentions.

	Model 1		Model 2	
	Yes	Don't know	Yes	Don't know
Country (ref. England)				
Wales	-0.326 ***	0.302 **	-0.263 **	0.360 **
Scotland	-0.300 ***	0.078	-0.198 **	0.114
Age group (ref. 16-24)				
25-29	-0.519 ***	-0.110	-0.746 ***	-0.116
30-34	-1.779 ***	-0.619 ***	-2.022 ***	-0.609 ***
35-39	-3.504 ***	-1.602 ***	-3.698 ***	-1.566 ***
Survey year	0.033 ***	-0.027 ***	0.033 ***	-0.035 ***
Partnership status (ref. unpartnered)				
Cohabiting			0.772 ***	-0.226
Married			0.634 ***	-0.207 **
Educational qualifications (ref. degree)				
Advanced			-0.801 ***	-0.584 ***
GCSE, O level, CSE			-1.301 ***	-0.918 ***
Foreign & other			-1.928 ***	-1.261 ***
None			-1.750 ***	-1.041 ***
Economic Activity (ref. employed)				
Unemployed			0.555 ***	0.163
Inactive			0.484 ***	0.287 ***
Housing Tenure (ref. owner occupied)				
Privately rented			-0.091	-0.078
Socially rented			0.265 ***	-0.081
Country of birth (ref. UK)				
EU & Ireland			0.420 *	0.470 *
Rest of World			0.827 ***	0.689 ***
Ethnicity (ref. White)				
Person of colour			0.285	0.259
Constant	0.914 ***	-0.390 *	1.673 ***	0.540 **

Table 4: Women with one child. Log odds ratios from multinomial logistic regression of whether intends to have an additional child. Baseline outcome category is "no". Britain, 1979-1990.
Source: Authors' analysis of CPC Harmonised GHS datasets

	Model 1				Model 2			
	Yes	Probably yes	Probably no	Don't know	Yes	Probably yes	Probably no	Don't know
Country (ref. England)								
Wales	-0.214	-0.375 **	-0.091	-0.476	-0.113	-0.271 *	-0.077	-0.409
Scotland	-0.105	-0.125	-0.053	0.364 **	-0.007	-0.024	-0.051	0.438 **
Age group (ref. 16-24)								
25-29	-0.352 ***	-0.328 ***	-0.220 *	-0.127	-0.791 ***	-0.505 ***	-0.297 **	-0.197
30-34	-1.275 ***	-0.885 ***	-0.114	-0.570 ***	-1.880 ***	-1.132 ***	-0.230 *	-0.683 ***
35-39	-2.919 ***	-2.365 ***	-0.663 ***	-1.469 ***	-3.591 ***	-2.647 ***	-0.812 ***	-1.640 ***
Survey year	0.035 ***	-0.027 ***	0.002	0.074 ***	0.018 ***	0.008	-0.017 **	0.058 ***
Partnership status (ref. unpartnered)								
Cohabiting					0.954 ***	0.291 ***	-0.282 **	-0.447 **
Married					0.953 ***	0.195 **	-0.323 ***	-0.326 **
Educational qual. (ref. degree)								
Advanced					-0.955 ***	-0.793 ***	-0.509 ***	-0.740 ***
GCSE, O level, CSE					-1.337 ***	-1.092 ***	-0.784 ***	-0.950 ***
Foreign & other					-1.306 ***	-1.239 ***	-0.467 *	-1.021 **
None					-1.711 ***	-1.448 ***	-1.092 ***	-0.921 ***
Economic Activity (ref. employed)								
Unemployed					0.132	0.214	0.059	-0.295
Inactive					0.179 **	0.209 *	0.003	0.053
Housing Tenure (ref. homeowner)								
Privately rented					-0.201 *	-0.094	-0.113	-0.131
Socially rented					-0.373 ***	-0.179 *	-0.307 **	-0.242
Country birth (ref.UK)								
EU & Ireland					0.240	0.436 **	0.175	0.805**
Rest of World					0.252	0.229	-0.234	0.316
Ethnicity (ref. White)								
Person of colour					0.519 ***	0.582 ***	-0.086	0.336
Constant	0.377 ***	0.046	-0.418 **	-2.798 ***	1.565 ***	1.318 ***	0.993 ***	-1.345 ***

Table 5: Women with one child. Log odds ratios from multinomial logistic regression of whether intends to have an additional child. Baseline outcome category is "no". Britain, 1991-2009.

Source: Authors' analysis of CPC Harmonised GHS datasets

	Model 1		Model 2	
	Yes	Don't know	Yes	Don't know
Country (ref. England)				
Wales	-0.323 **	-0.053	-0.296 **	0.013
Scotland	-0.085	0.064	-0.129	0.140 *
Age group (ref.16-24)				
25-29	-0.899 ***	-0.348	-0.769 ***	-0.274 ***
30-34	-2.046 ***	-0.838 ***	-1.844 ***	-0.729 ***
35-39	-3.568 ***	-1.719 ***	-3.256 ***	-1.537 ***
Survey year	0.052 ***	-0.014 *	0.044 ***	-0.027 ***
Partnership status (ref. unpartnered)				
Cohabiting			0.505 **	0.363
Married			-0.128	-0.449 ***
Educational qualifications (ref. degree)				
Advanced			-0.935 ***	-0.732 ***
GCSE, O level, CSE			-1.223 ***	-0.964 ***
Foreign & other			-1.177 ***	-1.086 ***
None			-1.489 ***	-1.170 ***
Economic Activity (ref. employed)				
Unemployed			0.593 ***	0.386 ***
Inactive			0.522 ***	0.438 ***
Housing Tenure (ref. owner occupied)				
Privately rented			0.320 ***	-0.021
Socially rented			0.282 ***	-0.079
Country of birth (ref. UK)				
EU & Ireland			0.421 **	0.760 ***
Rest of World			0.420 ***	0.464 ***
Ethnicity (ref. White)				
Person of colour			0.437 **	0.636 ***
Parity (ref. 2 children)				
3+ children			-0.433 ***	-0.297 ***
Constant	-0.908 ***	-1.196 ***	-0.054	-0.082

Table 6: Women with two or more children. Log odds ratios from multinomial logistic regression of whether intends to have an additional child. Baseline outcome category is "no". Britain, 1979-1990.
Source: Authors' analysis of CPC Harmonised GHS datasets

	Model 1				Model 2			
	Yes	**Probably yes**	**Probably no**	**Don't know**	**Yes**	**Probably yes**	**Probably no**	**Don't know**
Country (ref. England)								
Wales	-0.111	-0.534 **	-0.230 **	-0.194	0.091	-0.383 **	-0.177 *	-0.032
Scotland	-0.324 **	-0.456 ***	-0.276 ***	-0.063	-0.228	-0.327 **	-0.206 **	0.063
Age group (ref. 16-24)								
25-29	-0.568 ***	-0.562 ***	0.216 *	0.003	-0.474 ***	-0.506 ***	0.145 **	0.036
30-34	-1.796 ***	-1.335 ***	-0.086	-0.557 ***	-1.651 ***	-1.127 ***	-0.230 *	-0.526 **
35-39	-3.060 ***	-2.651 ***	-0.638 ***	-1.291 ***	-2.837 ***	-2.574 ***	-0.802 ***	-1.231 ***
Survey year	0.016 **	0.028 ***	0.005	0.077 ***	0.000	0.008	-0.012 **	0.055 ***
Partnership status (ref. unpartnered)								
Cohabiting					0.676 ***	0.172 ***	-0.041	0.015
Married					0.439 ***	-0.218 *	-0.114	-0.428 ***
Educational qual. (ref. degree)								
Advanced					-0.854 ***	-0.786 ***	-0.617 ***	-0.443 **
GCSE, O level, CSE					-0.973 ***	-1.029 ***	-0.956 ***	-0.753 ***
Foreign & other					-0.662 **	-0.960 ***	-1.321 ***	-0.728 **
None					-1.225 ***	-1.148 ***	-1.398 ***	-0.946 ***
Economic Activity (ref. employed)								
Unemployed					0.220	0.004	-0.043	-0.304
Inactive					0.502 ***	0.245 ***	0.185 ***	0.258 **

	Model 1				Model 2			
	Yes	**Probably yes**	**Probably no**	**Don't know**	**Yes**	**Probably yes**	**Probably no**	**Don't know**
Country (ref. England)								
Housing Tenure (ref. homeowner)								
Privately rented					0.420 ***	0.191 *	0.033	0.054
Socially rented					0.223 **	-0.031	-0.227 ***	-0.167
Country birth (ref. UK)								
EU & Ireland					0.152	0.297	0.208	0.872 ***
Rest of World					0.374 *	0.359 **	-0.009	0.412 **
Ethnicity (ref. White)								
Person of colour					0.758 ***	0.828 ***	0.430 ***	0.805 ***
Parity (ref. 2 children)								
3+ children					-0.953 ***	-0.527 ***	-0.349 ***	-0.308 ***
Constant	-1.313 ***	-1.300 ***	-1.416 ***	-4.137 ***	1.565 ***	-0.020 ***	0.069	-2.909 ***

Table 7: Women with two or more children. Log odds ratios from multinomial logistic regression of whether intends to have an additional child. Baseline outcome category is "no". Britain, 1991-2009.
Source: Authors' analysis of CPC Harmonised GHS datasets

4. DISCUSSION

This research updates earlier work which identified a significant difference in childbearing behaviour between women living in Scotland and those in England and Wales. Whilst all countries have experienced further decline in fertility rates, Scotland's fertility has declined more than either of the other countries. All three countries have seen a large postponement of childbearing to later ages and there are no differences in rates of childbearing at younger ages. The difference appears to be due to lower rates of childbearing among women in their thirties and forties in Scotland as compared to England. From the data available from vital registration we cannot conclude whether these lower rates of childbearing are due to fewer women in Scotland entering motherhood at later ages, or fewer mothers in their thirties and forties having second, third and higher order births. This is because true birth order was only collected in the Scottish vital registration system since 2012 (National Records of Scotland 2014). This paper used fertility history data from nationally representative surveys to examine this question. Whilst we did find some evidence that Scottish women were slightly more likely to remain childless, and less likely to have larger families, the sample sizes in the survey are not sufficient to draw firm conclusions. Future work needs to use census linked administrative data from vital registration such as the ONS Longitudinal Study and the Scottish Longitudinal Study in order to identify cross-national differences. Analysis of childbearing behaviour by age, parity and duration since last birth (for second and higher order births) is required.

Our study suggests that there are small differences across the countries in fertility intentions, at least among those who already have at least one child. Differences in fertility desires and intentions across Britain may relate to the desire for larger families rather than wanting to become a parent. Our analyses showed that there are clear socio-economic factors which are associated with intending a larger family, including age, education, economic activity, country of birth and ethnicity. Importantly, the lower likelihood of Scottish women with two children to intend to have another child persisted when all of these factors were controlled. Thus we cannot explain the more positive fertility intentions of women living in England as being mostly the result of increased levels of international migration, or the higher number of the descendants of migrants living in England.

It is interesting that these cross-national differences in intentions became stronger in the period of 1991-2009, as compared to the earlier period (1979-1990). This may be because there is a reciprocal feedback between observed fertility behaviour and intentions. In countries where fertility levels have been low for a significant period of time, intentions to have children have also declined because individuals when they are growing up and entering adulthood observe the levels of fertility around them. Thus observed small family sizes in Scotland will encourage the next generation to have smaller family size intentions (Goldstein et al., 2003). Still, the differences in fertility intention according to country are relatively small. Therefore, for whatever reason, Scottish women are less able to achieve their intended fertility, particularly second and third births. This provides support for the approach taken by the Scottish Government (2021) in seeking to reduce barriers to childbearing and the gap between desired and actual family size.

REFERENCES

Beaujouan, É., Berrington, A., Lyons-Amos, M., & Ni Bhrolchain, M. (2014). User guide to the Centre for Population Change GHS database 1979-2009. Centre for Population Change Working Paper 47, ESRC Centre for Population Change, UK. Available at: https://www.cpc.ac.uk/docs/2014_WP47_CPC_GHS_User_Guide_P_et_al.pdf

Beaujouan, E., & Berghammer, C. (2019). The gap between lifetime fertility intentions and completed fertility in Europe and the United States: A cohort approach. *Population Research and Policy Review*, *38*(4), 507-535.

Becker, G. (1981). *A Treatise on the Family.* National Bureau of Economic Research, Inc.

Berrington, A. (2004). Perpetual postponers? Women's, men's and couple's fertility intentions and subsequent fertility behaviour. *Population Trends*, *117*, 9-19.

Berrington, A. (2021). Fertility desires, intentions, and behaviour. In *Research Handbook on the Sociology of the Family* (pp. 248-262). Edward Elgar Publishing.

Berrington, A., & Pattaro, S. (2014). Educational differences in fertility desires, intentions and behaviour: A life course perspective. *Advances in Life Course Research*, 21, 10-27.

Berrington, A., Stone, J., & Beaujouan, E. (2015). Educational differences in timing and quantum of childbearing in Britain: A study of cohorts born 1940–1969. *Demographic Research*, 33, 733-764.

Brinton, M. C., Bueno, X., Oláh, L., & Hellum, M. (2018). Postindustrial fertility ideals, intentions, and gender inequality: A comparative qualitative analysis. *Population and Development Review*, 44(2), 281-309.

Chamberlain, J.& Smallwood, S. (2004). Estimates of true birth order for Scotland, 1945-1999. *Population Trends*. 117. 27-42.

Dubuc, S. (2012). Immigration to the UK from high-fertility countries: Intergenerational adaptation and fertility convergence. *Population and Development Review*, 38(2), 353-368.

Eurostat (2022) Fertility Statistics. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fertility_statistics

General Register office for Scotland (2008) *Scotland's Population 2007. The Registrar General's Annual Review of Demographic Trends 153rd Edition.* Available at: https://www.nrscotland.gov.uk/files/statistics/scotlands-population-2007-the-register-generals-annual-review-153rd-edition/scotlands-population-2007-the-register-generals-annual-review-153rd-edition.pdf

Goldstein, J., Lutz, W., & Testa, M. R. (2003). The emergence of sub-replacement family size ideals in Europe. *Population Research and Policy Review*, 22(5), 479-496.

Graham, E., Boyle, P., Bouliotis, G., Gayle, V. and Ermisch, J. (2007). *Why is Fertility in Scotland Lower than in England?* Full Research Report. ESRC End of Award Report, RES-342-25-0003. Swindon: ESRC.

Kravdal, Ø. (2001). The high fertility of college educated women in Norway: An artefact of the separate modelling of each parity transition. *Demographic Research*, 5, 187-216.

Kulu, H., & Hannemann, T. (2016). Why does fertility remain high among certain UK-born ethnic minority women? *Demographic Research*, *35*, 1441-1488.

Kulu, H., Hannemann, T., Pailhé, A., Neels, K., Krapf, S., González-Ferrer, A., and Andersson, G. (2017). Fertility among the descendants of immigrants in selected European countries. *Population and Development Review* 43(1), 31-60.

Murphy, M. J., & Sullivan, O. (1985). Housing tenure and family formation in contemporary Britain. *European Sociological Review*, 1(3), 230-243.

National Records of Scotland (2014). Numbers of previous live and stillbirths. Available at:

https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/births/background-information/numbers-of-previous-live-and-stillbirths.

National Records of Scotland. (2022). Vital Events Reference Tables 2021. Available at: https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/general-publications/vital-events-reference-tables/2021

Ní Bhrolcháin, M., Beaujouan, E., & Berrington, A. (2010). Stability and change in fertility intentions in Britain, 1991–2007. *Population Trends*, *141*(1), 13-35.

Ní Bhrolcháin, M. N., Beaujouan, É., & Murphy, M. (2011). Sources of error in reported childlessness in a continuous British household survey. *Population Studies*, 65(3), 305-318.

Office for National Statistics (2013) General Lifestyle Survey. Available at: https://www.data.gov.uk/dataset/f2fd6746-3298-46d8-a393-3805cb07d431/general-lifestyle-survey

Office for National Statistics. (2022a). Births in England and Wales: Summary Tables. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsummarytables

Office for National Statistics. (2022b). Births by parents' country of birth, England and Wales: 2021. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/parentscountryofbirthenglandandwales/2021

Office for National Statistics (2022c). Estimated age-specific and total fertility rates for UK-born and non-UK-born women living in the UK, Scotland and Northern Ireland. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/adhocs/14218estimatedagespecificandtotalfertilityratesforukbornandnonukbornwomenlivingintheukscotlandandnorthernireland

Robards, J., & Berrington, A. (2016). The fertility of recent migrants to England and Wales. *Demographic Research*, 34, 1037-1052.

Scottish Government. (2021). *A Scotland for the future: opportunities and challenges of Scotland's changing population.* Available at: https://www.gov.scot/publications/scotland-future-opportunities-challenges-scotlands-changing-population/pages/1/

Sobotka, T., & Beaujouan, É. (2014). Two Is best? The persistence of a two-child family ideal in Europe. *Population and Development Review*, 40(3), 391-419.

Tocchioni, V., Berrington, A., Vignoli, D., & Vitali, A. (2021). The changing association between homeownership and the transition to parenthood. *Demography*, *58*(5), 1843-1865.

Vignoli, D., Rinesi, F., & Mussino, E. (2013). A home to plan the first child? Fertility intentions and housing conditions in Italy. *Population, Space and Place*, *19*(1), 60-71.

CPC
CENTRE FOR POPULATION CHANGE

CONNECTING GENERATIONS

ESRC Centre for Population Change
Connecting Generations

Building 58
Faculty of Social Sciences
University of Southampton
SO17 1BJ

Tel: +44(0)2380592579
Email: cpc@southampton.ac.uk

To subscribe to the CPC newsletter and keep up-to-date with research activity, news and events, please register online:
www.cpc.ac.uk/news/newsletter

For our latest research updates you can also follow CPC and Connecting Generations on social media:

@CPCpopulation @ConnectingGens
/CPCpopulation

University of Southampton
University of St Andrews
UNIVERSITY of STIRLING

LEVERHULME CENTRE FOR DEMOGRAPHIC SCIENCE
Resolution Foundation
Office for National Statistics
National Records of Scotland

Producing novel science
Informing policy
Improving knowledge on population change

cpc.ac.uk

ISSN 2042-4116