

Lifelong childlessness in England and Wales

Evidence from the ONS Longitudinal Study

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Abstract

Previous research on childlessness suggests that childless women differ from those with children mainly in terms of their attitudes and values. In the literature, mixed evidence exists regarding how distinctive childless women are in terms of their socio-economic characteristics. Data from the Office for National Statistics (ONS) Longitudinal Study (LS) is used for the first time to investigate the personal and household characteristics of women born between 1956 and 1960 in relation to their lifelong fertility outcomes. Logistic regression techniques are used to model the probability of lifetime childlessness based on a number of women's and their partners' socio-economic characteristics at various key ages during women's life-course. Single women are the most likely to be childless and married women are least likely to be childless. For those with partners, childless women are more often in "non-traditional" partnership, including cohabitations, and tend more often to have wider age gaps with their partners. In terms of women's own characteristics, the economically active are more likely to be childless and childless women have a slightly higher social and economic status as compared to mothers. Childlessness is often associated with presence of a limiting long term illness and a lack of any siblings in childhood. Using administrative and Census records available in the LS, it is possible to provide robust statistical evidence that childless women appear to be a distinctive group in terms of key socio-economic characteristics. This analysis also shows the potential of the LS to be used more frequently for quantitative research on childlessness alongside other survey data sources.

Keywords: Childlessness, fertility, ONS Longitudinal Study, women, England and Wales, longitudinal research

Background and Literature Review

Since the post second world war baby boom, there has been a dramatic change in childbearing patterns throughout the developed world (Sobotka, 2004). In general, women in most countries have been delaying starting a family, with births to women aged below 30 declining sharply over this period. Women have also been having fewer children on average and increasing numbers of women have been remaining childless. This has resulted in the fertility decline observed in the

Western world, where many countries are now experiencing low and very low fertility (e.g. McDonald, 2000, Castles, 2003). Total fertility ratesⁱ (TFR) dropped sharply between the mid-1960s and mid-1970s and then fell during the 1990s reaching a record low TFR in 2001 of 1.63; since 2001 TFR have shown a steady increase (Jefferies, 2008). UK births data has also shown an increase in the mean age of mothers at first birth. Between 1996 and 2006, mean age of mothers at first birth in England and

Wales rose from 26.7 to 27.6 (ONS, 2007). These trends led Kneale and Joshi (2008) to suggest that “fertility is becoming lower and later among British women” (Kneale and Joshi, 2008).

This paper focuses on childlessness in England and Wales which has been identified as an important driver of the observed fertility decline (Simpson, 2006). For example, using data from ONS Birth Statistics (ONS, 2002), Berrington (2004) showed how the increase in childlessness from 10% of women in 1945 to 19% of women in 1960 was the driving force behind the decline in average completed family size in England and Wales from 2.18 in 1945 to 1.95 in 1960. The literature suggests that childlessness is not a new phenomenon. Hakim (2003) reported that in the past, 20% of women in the UK remained childless due to poverty, poor nutrition and low marriage rates caused by wars and emigration. However, in the post second world war period, childlessness reached an all time low in Britain (Coleman, 1996). Since then, the proportion of women in England and Wales who are childless at the end of their reproductive years (at ages 45 and above) has been increasing, from an estimated 10% of the 1945 cohort to 19% of women born in 1960 (ONS, Birth Statistics, 2008). Importantly, contemporary childlessness has been identified as being different from childlessness in the past, as it is occurring increasingly often amongst healthy females who are living within marriage and cohabitation, and who are sexually active (Coleman, 1996).

There are contrasting predictions of the scale of childlessness in England and Wales for the future. The 2006-based National Population Projections suggested that 19% of those women born in the second half of the 1970s and 1980s in England and Wales will remain childless by the age of 45, and that this will rise to 20% for those women born during the 1990s (Bray, 2008). These estimates of childlessness are similar to those predicted by Hakim (2003) who, using preference theory which theorises that in the contemporary world women have the freedom to choose how they live, estimates that approximately 20% of women will concentrate on their career rather than on their family life, and that a high proportion of this 20% will be childless throughout their lives. Sobotka (2004) predicted higher rates of childlessness, between 23% and 25% among women born in 1975 in England and Wales. Sobotka (2004) used period

and cohort fertility data from a range of sources including vital statistics records, census results, expert estimates based on vital statistics, large-scale family surveys and population registers, to make projections of final childlessness in 16 European countriesⁱⁱ and the United States. It is suggested that England and Wales has one of the highest levels of projected childlessness, with similar levels to Austria, Finland, West Germany, Italy and Poland (Sobotka, 2004).

The socio-economic characteristics of contemporary women who remain childless and how they differ from mothers have been the focus of much research. Although delayed childbearing is associated in the literature with higher levels of education, higher occupational status and greater material resources (Sobotka, 2004), the degree to which childless women are distinctive in terms of their socio-economic characteristics when compared with those with children is less clear. For example in Britain, Kiernan (1989) used data from the nationally representative National Survey of Health and Development, which is a longitudinal study of a sample of a cohort born in 1946, to try to identify the characteristics which distinguished those who were childless from those who were parents. Kiernan’s (1989) analysis, based on a sample of 1,924 female respondents aged 36 years old in 1982 indicated that married women who married at a later age and those who were only children were more likely to be childless. However, despite some of the literature suggesting a link between falling fertility and increasing levels of female education (e.g. Hotz et al, 1997) and employment (Becker, 1991), Kiernan found no strong association between childlessness and education, and childlessness and occupation.

Hakim (2003) found even less evidence to suggest that childless females were distinctive from mothers in terms of their socio-economic characteristics. This study used data from the Family and Fertility Surveys (FFS) in 21 European countriesⁱⁱⁱ and, for Britain, data from the 1958 National Child Development Study (NCDS) and the 1970 British Cohort Study (BCS). In the British context, this study had a large sample of childless females as the NCDS provided information on 1,143 42-year-old childless women and the BCS provided data on 2,618 30-year-old women. Although this study found that socio-economic differences between the childless and parents were more

pronounced for women than men (who were also included in the study), it concluded that childless women were distinctive from those with children in terms of their attitudes and values rather than their socio-economic characteristics. For example, Hakim (2003) reported that although a high percentage of females employed in higher grades were childless, this was not a distinctive characteristic of childless females because the majority of childless women were still employed in middle and lower grade occupations.

More support for the finding that childless women are distinctive in terms of their attitudes and values can be found elsewhere in the literature. For instance, Berrington (2004) reported that amongst 199 childless women in their thirties, included in the British Household Panel Survey, women who had more egalitarian attitudes about women's paid work outside the home were significantly less likely to intend to start a family. McAllister and Clarke (1998) interviewed a relatively small number of women (34) in the UK, to investigate why they had chosen to be childless. This study found that childless women did not have a negative perception of children or unconventional views on parenthood and that they were not motivated to be childless by career aspiration. Instead, the voluntary childless in this sample were motivated by general quality of life issues (e.g. economic security and good housing) and did not want the disruption and change to their lifestyle that it was perceived parenthood would bring.

As shown in this brief review of the literature, most quantitative research on childlessness in the UK has analysed data collected through traditional cross-sectional and panel surveys such as the General Household Survey (Murphy, 2008), the British Household Panel Survey (Berrington, 2004) and, notably, the Birth Cohort Studies (Hakim, 2003; Simpson, 2006; Kneale and Joshi, 2008). In this paper we use for the first time a linkage study of administrative records, the ONS Longitudinal Study (LS), to revisit the issue of the extent to which childless women are from a distinctive social or economic group relative to women with children in England and Wales. We also use the longitudinal nature of the LS^{iv} to investigate the relationship between lifelong fertility outcomes and personal and household characteristics at various points during women's life-course.

It was a particularly appropriate time to use the LS to study childless women, because for the first time the study covered the entire 15-45 childbearing age span for a cohort of women, those born between 1956 and 1960. This feature of the LS enabled us to be confident that the women categorised as childless in our study were lifelong childless and were not merely fertility postponers. This was particularly important as people are increasingly postponing having children rather than avoiding having them altogether (Kneale and Joshi, 2008). Analysis of data covering the entire childbearing age span was important to ensure that premature conclusions were not reached on women's fertility behaviours.

Data and Methods

The ONS Longitudinal Study

The LS is a dataset of linked census and vital events records for one per cent of the population of England and Wales. It includes linked individual records from the 1971, 1981, 1991 and 2001 Censuses, together with routine events registrations such as births, deaths and cancer registrations.

The sample was initiated at the time of the 1971 Census, when all people born on four selected dates in any calendar year were included in the sample. The same four dates were used again to update the sample in 1981, 1991 and 2001. Intercensally, new members are entered by virtue of birth on LS dates or by immigration (if born on LS dates) and exited by death or emigration. The study was designed as a continuous, multi-cohort study, with subsequent samples being drawn at each census, using the same selection criteria, and linked into the study to previous census records and/or a birth or immigration record.

The LS shares some of the limitations of the Census, one of its data sources. For instance, the Census information covers a limited range of topics, it mostly relates to people's circumstances at the time and it is collected only once every ten years. Individual information typically collected at most Censuses includes age, sex, marital status, social class, education, economic activity. To date, Censuses have not included any questions on financial circumstances or behaviours and attitudes that are available in other surveys. As a consequence, in our study it was not possible to distinguish between voluntary and involuntary

childlessness^v and it was not possible to investigate how different childless women and mothers were in terms of their attitudes and opinions^{vi}.

Although Census information is only linked into the study every ten years, at any one point in time the LS is largely representative of the England and Wales population as a whole, with events data (births, deaths, immigrations, deaths and cancer registrations) linked into the study on an annual basis.

Over the thirty plus years of the study, data on approximately one million individuals have been collected. This means that the LS has a far larger sample size than any other longitudinal study in England and Wales, thus allowing for robust statistical inference.

Additionally, the LS does not suffer from some of the data quality issues affecting more traditional panel surveys. For example, as it is a linkage study of administrative records, it is not affected by attrition due to non-response or by respondents' memory bias as survey data may be.

The LS also includes Census information for people who are enumerated in the same household as the LS member. This provides the opportunity to investigate the family contexts in which specific fertility behaviours occur. However, the information on people enumerated at the same private address as the LS member is not linked through time, and as such it can only be analysed cross-sectionally.

Definition of childlessness

This research analysed a sample of 12,578 LS female members, all born between the years 1956 and 1960 (included) and continuously resident in England and Wales during their entire childbearing age span, conventionally considered to be between 15 and 45 years old. As only births

registered in England and Wales are linked to LS mothers, continuous residence in either of the two countries was required to ensure that fertility outcomes were correctly assigned to each woman. The sample therefore excluded women who entered the country after the age of 15, those who left it before the age of 45, as well as any other woman temporarily absent from England and Wales between these two ages, as indicated by their absence at one of the Censuses. Also, all women who died before 45 years of age were not included in the sample.

The analysis focused on lifelong childlessness. A woman was defined as being childless if she had not had any live or still birth by December 2005, when she was aged between 45 and 50. Childlessness was defined from a biological perspective, although a childless woman may actually have acted as a mother to children that she did not bear herself (e.g. foster and adoptive parents and women looking after their partner's children). Similarly, a biological mother may not have acted as such from a social perspective (e.g. a mother whose child has been adopted by other parents). However, for simplicity of expression, we will from here on refer to the first group as "childless" and to the second as "mothers".

Table 1 compares the percentages of childless women in the LS with ONS published 2005 Birth Statistics for England and Wales^{vii} (ONS, Birth Statistics, 2006). Overall, 2,194 LS women from the 1956-1960 cohorts had not given birth by the end of 2005. This was around 17% of the sample and was consistent with national estimates. The LS could therefore be considered to be a reliable and representative sample of childless females in England and Wales as a whole.

Table 1: Childless women in the LS and England & Wales by birth cohort, 2005^{viii}

Cohort	Percentage of childless women	
	LS	England and Wales
1956	16.5 (15.0 – 18.0)	16.0
1957	17.0 (15.5 -18.5)	17.0
1958	18.0 (16.5 - 20.0)	18.0

(Table 1 continued)

1959	17.9 (16.4 -19.4)	18.0
1960	17.8 (16.4 – 19.3)	18.0

Note: Figures in brackets represent the 95% confidence intervals for the LS estimates

Source: ONS Longitudinal Study, FM1 Births Statistics, Authors' analysis

Methods

This research used LS data from the 1981, 1991 and 2001 Censuses to investigate the circumstances of women at different key ages and to see how these were associated with their lifelong fertility outcomes. The analysis investigated the extent to which childless women appeared to be distinctive from women with children in terms of several social and economic characteristics. The choice of explanatory variables was informed by the review of both qualitative and quantitative literature related to childlessness (e.g. Hakim, 2005; Parr, 2005; Hakim 2003; McAllister and Clarke 1998), followed by bivariate analysis of association between life-long fertility outcomes and LS socio-economic variables (Portanti and Whitworth, 2009).

The relationship between socio-economic circumstances and fertility behaviours may be quite complex. For example, childbearing may lead some women to leave the labour force, thus showing how parenthood may impact on employment patterns. At the same time however, employment may impact on parenthood. For instance, several empirical studies have found that an increase in women's wage is associated with first birth postponement (de Cooman et al, 1987; Joshi, 2002).

It was beyond the scope of the analysis to disentangle cause-effect relationships between the study variables. Instead, we concentrated on identifying and measuring the association between several socio-economic characteristics and childlessness, without debating the direction of this association.

Various studies have also pointed out how contemporary childlessness is occurring more frequently within marriage and cohabitation (e.g. Coleman 1996; Hakim, 2005). Using information on marital status and cohabitations at the 1981, 1991 and 2001 Censuses, we also estimated that at least 68% of childless women in our sample had been cohabiting for some time with a partner during their childbearing years (see Table 2). We therefore

decided to also measure the extent, if any, to which the partners of childless women were distinctive from the partners of those who had become mothers by 2005. This allowed us to measure the association of the partner's characteristics on a woman's fertility outcomes.

Unfortunately in the LS, partners are not linked through time so only cross-sectional analysis was possible. We chose to analyse women in a partnership in 1991, when they were in their early-mid thirties, as this appeared to be a key time point for our cohort lifelong fertility outcomes. Indeed, we estimated that between 94% and 96% of the 1956-60 cohort mothers had their first child by their mid-thirties (authors' calculations based on 2006 ONS data).

In order to identify the key features distinguishing childless women from mothers, logistic regression techniques were used to model the probability of lifetime childlessness based on a number of women's and their partners' individual characteristics. This multivariate analysis allowed the estimation of the level of association of each explanatory variable with childlessness, after adjusting for the effects of other variables.

We first fitted a logistic model on the whole sample of women using women's individual characteristics as independent variables. A second logistic regression model was then separately estimated for the subgroup of women who had a cohabiting partner or spouse when they were in their mid-thirties.

The sample for the first part of the analysis included 12,578 women, of which 2,194 were childless and 10,384 were mothers. The analysis of women with partners included a sub-sample of 9,786 women who were enumerated living with a partner in the 1991 Census. Around 50% of the initial childless group (1,101 women) and 84% of the mother group (8,685 women) had a partner in 1991.

Women's individual characteristics

Socio-economic variables including marital/partnership status, education, economic activity and social class are available in the LS for each Census from 1971. This allowed us to adopt a life-course perspective when investigating the extent to which sample women, who were lifelong childless, differed from the mothers group. We compared the two groups of women not only at the end of their childbearing age, but also throughout their childhood and adulthood.

Three marital status variables were considered, providing information on women's partnership status in their twenties (1981 Marital Status), thirties (1991 Marital Status) and forties (2001 Marital Status). Marital status information however provides only a partial picture of partnerships, as it does not capture consensual unions (cohabitations). As the LS includes information on those individuals enumerated in the same household as the LS member, we could also identify those women cohabiting with a partner, irrespective of their legal marital status. We derived three new "living arrangements" variables, one for each of the aforementioned timepoints, by combining information on marital status and cohabitation. The living arrangement variable allowed us to distinguish between single (never married) women, who were cohabiting with a partner, and those without a cohabiting partner.

Women's ethnicity, economic activity, social class and educational attainment were also included in the analysis. Social class was defined using the Social Class based on Occupation classification (previously known as the Registrar General's Social Class classification). In 1991 and 2001, the Census included a question on health, asking all respondents whether they had any long-term illness, health problem or disability which limited their daily activities or the work that they could do. In the absence of more detailed information, we used this as a proxy for the health status of respondents.

Variables whose values are typically determined either at birth or during a person's childhood are known as early lifecourse variables. These have been shown to have significant predictive power for identifying which women will be childless in later life (Parr 2005). We therefore included in the analysis, two variables related to the household and family context in which women lived during their own childhood. These were the presence of siblings and the Main Economic Support social class in a woman's 1971 household.

Table 2 presents the frequency distribution of some of the variables that have been discussed in this section. The differences between the childless and the mothers group for all the frequencies reported here were statistically different at the 0.05 significance level.

Table 2: Childless women's and mothers' profiles

	% of CHILDLESS women who...	% of MOTHERS who...
Marital status 2001		
were single (never married)	40.2	5.3
were in their first marriage	35.3	59.9
were re-married	8.9	12.8
were divorced	12.6	16.3
Living arrangements		
were in a cohabiting partnership at at least one Census	67.7	95.4
Economic activity		
were economically active (1981)	89.4	67.9
were economically active (1991)	89.2	62.1
were economically active (2001)	84.5	78.5

(Table 2 cont'd)

Social Class 2001		
were in a manual social class	19.7	32.1
were in a non-manual social class	75.3	63.6
Ethnicity 2001		
were of White ethnicity	97.9	97.2
were of Asian ethnicity	0.6	1.2
Limiting long-term illness 2001		
had a limiting long-term illness	17.1	11.7
Siblings 1971		
had no sibling present in their 1971 household	14.9	11.4
Education 2001		
were educated at degree level and above	26.8	19.2
did not have any academic or professional qualification	16.8	21.7
Social Class Main Economic Support (MSE) 1971		
MSE in a Manual Occupation	57.7	63.4
MSE in a non Manual Occupation	37.9	32.3

Base: 12,578 women, of which 2,194 childless and 10,384 mothers

Difference between childless women and mothers statistically significant at the 0.05 level for each variable's category.

Partner's variables

The second part of the analysis investigated women living with a partner in 1991. In addition to women's individual variables, we included in the analysis four partner's variables: age, educational attainment, marital status and social class. In particular we treated these variables in relation to the equivalent women's variables. For example, we

looked at whether the age gap between partners tended to be wider or narrower among the childless group compared to the mothers group.

Table 3 presents a selection of descriptive statistics for these variables for the childless and the mothers group separately.

Table 3: Couples' profiles, 1991 Census

	% of CHILDLESS women who...	% of MOTHERS who were...
Age gap between partners 1991		
whose partner was more than 5 years younger	4.8	2.7
whose partner was between 6 and 10 years older	16.6	12
whose partner was more than 10 years older	10.8	4.3

(Table 3 cont'd)

Living arrangements 1991		
were in their first marriage and whose partner was in a first marriage, too	52.6	73.9
were in their first marriage and whose partner was re-married	12.8	7.4
were single and cohabiting with a single partner	10.9	2.8
were single and cohabiting with a divorced partner	5.7	1.2
Social class 1991		
were in a higher social class than their partner	39.0	34.1
were in the same social class as their partner	30.5	25.2
were in a lower social class than their partner	30.6	40.8
Education 1991		
were more educated than their partner	12.8	8.1

Base: 9,786 women, of which 1,101 childless and 8,675 mothers

Difference between childless women and mothers statistically significant at the 0.05 level for each variable's category.

Results

Women's model

Table 4 presents the result of the logistic regression modelling of childlessness using women's individual characteristics only in the explanatory part of the equation.

Table 4: Logistic regression model for probability of lifetime childlessness, all women

Variable	Beta coefficient	Standard error.	Odds ratio
Living arrangements 1981. Baseline: married (first marriage)			
Single (never married)	0.88***	0.07	2.42
Single (never married) but living with a partner	0.38*	0.16	1.46
Re-married	0.44	0.32	1.55
Divorced, widowed	0.04	0.23	1.04
Living arrangements 1991. Baseline: married (first marriage)			
Single (never married)	1.25***	0.11	3.49
Single (never married) but living with a partner	0.80***	0.12	2.23
Re-married	0.17	0.15	1.19
Divorced, widowed	0.52***	0.11	1.69

Variable	Beta coefficient	Standard error.	Odds ratio
Living arrangements 2001. Baseline: married (first marriage)			
Single (never married)	1.61***	0.12	5.00
Single (never married) but living with a partner	0.60***	0.14	1.81
Re-married	0.26*	0.12	1.30
Divorced, widowed	0.29***	0.09	1.33
Economic activity 1991. Baseline: Economically Inactive			
Unemployed	1.71***	0.16	5.52
Self-employed	1.22***	0.17	3.37
Employed	1.72***	0.10	5.58
Economic Activity 2001. Baseline: Economically Inactive			
Unemployed	0.69***	0.20	1.99
Self-employed	0.40***	0.14	1.49
Employed	0.55***	0.09	1.73
Social Class 1991. Baseline - Unskilled			
I - Professional	1.38***	0.25	3.97
II - Intermediate	1.32***	0.19	3.75
IIIN – Skilled Non Manual	1.15***	0.18	3.16
IIIM – Skilled Manual	1.18***	0.21	3.25
IV – Partly Skilled	0.61***	0.20	1.84
Other	0.76***	0.22	2.13
Ethnicity 2001. Baseline: White			
Mixed	0.06	0.40	1.07
Asian	-0.63	0.41	0.53
Black	-1.81***	0.35	0.16
Chinese	0.37	0.95	1.45
Has a Limiting Long Term Illness 1991	1.46***	0.13	4.31
Has a Limiting Long Term Illness 2001	0.55***	0.09	1.74
Does not have siblings 1971	0.33***	0.08	1.40
Constant	-5.78***	0.22	0.00

* Significant at the 0.05 level

*** Significant at the 0.01 level

Base: 12,578 women, of which 2,194 childless and 10,384 mothers

Source: ONS Longitudinal Study, Authors' analysis

As expected, living arrangements were strongly associated with childlessness. Women who were single, in the sense of never married, were consistently more likely to be lifetime childless, even when cohabiting with a partner. Also women who experienced the dissolution of their marriage were less likely to become mothers, even if re-married. The widows group, which accounted for a maximum of one per cent of the sample at any time point, was combined with the divorced group as they showed similar patterns of childlessness.

Living arrangements at different ages had a different association with lifetime childlessness. Women who were cohabiting with a partner in their early thirties were more likely to be childless than those who were cohabiting at any other age.

Participation in the labour market was also associated with childlessness. The odds of being childless for women who were employed in 1991 were 5.6 times those of women who were economically inactive. Also, women who were self-employed and unemployed at that time were more likely to be childless at the end of their childbearing years. Economic activity status in 2001 presented a similar pattern of association with childlessness, although weaker. The higher coefficients observed in 1991 as compared to 2001 could have been a reflection of mothers returning to work after childbearing and childrearing.

The model also presented a social class gradient, showing how the odds of childlessness for women from higher social classes were up to four times those of women from lower social classes. Social class in 1981 and 2001 were excluded from the

model because of multicollinearity issues. The three social class variables were in fact highly correlated as the majority of the women in the sample experienced only limited social class mobility over time.

A relationship between health and childlessness was also confirmed, with childless women relatively more likely to have a limiting long term illness. This association was particularly strong for 1991, when the sample was in their early thirties, the middle of their reproductive time span.

Once social class was taken into account, most of the ethnic differences in fertility outcomes disappeared. Black women were the only ethnic minority to appear significantly less likely to be childless when compared to the White reference group.

The relationship between family background and whether or not a woman was childless, indicated in Table 3, was reduced to some extent after controlling for other variables. Although not having siblings still appeared to increase the likelihood of being childless later in life, the association between family-of-origin's social class and childlessness disappeared.

Women with a partner model

Table 5 presents the result of the logistic regression modelling of childlessness for women who were in a cohabiting partnership in 1991. In this model we included a number of partner's characteristics in addition to the women's individual characteristics identified in Table 4.

Table 5: Logistic regression model for probability of lifetime childlessness, women with a partner in 1991

Variable	Beta coefficient	Standard error	Odds ratio
Partner variables			
Age gap between partners 1991 Baseline: Woman's partner between one year younger and 1 year older			
Woman's partner more than 5 years younger	0.43*	0.19	1.54
Woman's partner between 5 and 2 years younger	0.10	0.12	1.10
Woman's partner between 2 and 5 years older	0.16	0.09	1.17
Woman's partner between 6 and 10 years older	0.52***	0.12	1.69
Woman's partner more than 10 years older	0.86***	0.15	2.35

(Table 5 cont'd)

Living arrangements 1991

Baseline: LS member and partner in their first marriage

LS member married (first marriage), partner re-married	0.40***	0.12	1.49
LS member single (never married), partner single (never married)	0.82***	0.17	2.28
LS member single (never married), partner divorced/widower	1.03***	0.20	2.80
LS member remarried, partner married (first marriage)	0.23	0.20	1.26
LS member remarried, partner remarried	0.38	0.20	1.46
LS member divorced/widow, partner single (never married)	0.62*	0.26	1.86
LS member divorced/widow, partner divorced/widower	0.53*	0.23	1.70

Women variables**Living arrangements 1981**

Baseline: Married (first marriage)

Single (never married)	0.81***	0.08	2.24
Single (never married) but living with a partner	0.41*	0.19	1.51
Re-married	0.60	0.33	1.81
Divorced, widowed	0.00	0.30	1.00

Living arrangements 2001

Baseline: Married (first marriage)

Single (never married)	1.02***	0.28	2.76
Single (never married) but living with a partner	0.55*	0.21	1.73
Re-married	0.05	0.15	1.05
Divorced, widowed	0.16	0.10	1.17

Economic activity 1991

Baseline: Economically Inactive

Unemployed	1.25***	0.24	3.50
Self-employed	0.96***	0.20	2.60
Employed	1.57***	0.12	4.82

Economic activity 2001

Baseline: Economically Inactive

Unemployed	0.35	0.28	1.42
Self-employed	0.19	0.17	1.20
Employed	0.31***	0.11	1.36

(Table 5 cont'd)

Social Class 1991

Baseline - Unskilled

I - Professional	1.63***	0.32	5.08
II - Intermediate	1.43***	0.26	4.17
IIIN – Skilled Non Manual	1.27***	0.25	3.57
IIIM – Skilled Manual	1.22***	0.29	3.39
IV – Partly Skilled	0.70***	0.27	2.02
Other	0.83***	0.31	2.29
Has a Limiting Long Term Illness 1991	1.20***	0.17	3.31
Has a Limiting Long Term Illness 2001	0.56***	0.12	1.75
Does not have siblings 1971	0.20*	0.10	1.22
Constant	-5.72***	0.30	0.00

* Significant at the 0.05 level

*** Significant at the 0.01 level

Base: 9,786 women, of which 1,101 childless and 8,675 mothers

Women in couples who were not in a first marriage were more likely to be childless. The odds were particularly high for those couples where at least one partner was single (never married), with the highest likelihood of childlessness recorded for those single women living with a divorced or widowed partner followed by couples where both partners were single.

Wide age gaps between the women and their partners appeared to be associated with childlessness. Women who had a partner more than five years older than themselves were more likely to be childless. Among women with partners over 10 years older, the odds of being childless were more than twice that for women who had a partner of the same age. A smaller, although still significant, coefficient was also found when women were more than five years older than their partner.

Although the analysis presented in Table 3 suggested childlessness to be related to differentials in educational levels between partners, this result was not confirmed in the multivariate analysis. Similarly, partner's social class did not appear to have a statistically significant association with women's fertility outcomes. These results may be explained by the presence of social class and/or educational differentials in partnership formation and dissolution, but this hypothesis was not explored in our data.

Discussion

The univariate and multivariate logistic regression models showed how the lack of a

partner still appears one of the main factors associated with childlessness. Unsurprisingly, women who were single at any Census were the most likely to be lifelong childless while married women were least likely to be lifelong childless. However, our analysis also showed that the majority of women who were lifelong childless still lived with a partner, either being married or cohabiting, at some point in time during the course of the study. We also found that women who were cohabiting at any Census were less likely than their married counterparts to be mothers and that the timing of a cohabitation was associated with a woman's lifelong fertility outcomes.

Women cohabiting in their early-mid thirties appeared more likely to be childless than women cohabiting at any other age. This could be explained by considering that women may have been in different types of cohabitation at different stages of their lives. For example, younger women may have been more likely to be in a pre-marital cohabitation, while post-divorce cohabitations may have been more common among older women. As Casper and Sayer (2000) suggested, cohabiting relationships are not homogenous in terms of their purposes, goals and meanings. We could argue that childbearing is likely to be more central for some types of cohabitations than for others.

Irrespective of their partnership status, women's own socio-economic characteristics were significantly associated with childlessness. For example, women who were economically inactive in their early-mid thirties and/or in their early-mid forties were more likely to be childless at the end of

their childbearing years. This was an expected result, considering that during childbearing and childrearing years, women's participation in the labour market tends to decrease. For example, in 2003, 68% of women with dependent children were in the labour market compared to 76% of those without children (ONS, 2004).

We found strong evidence of association between women's social class, as measured in 1991, and their lifelong fertility outcomes. Our findings confirmed Hakim's (2005) hypothesis that childless women have a slightly higher social and economic status, on average, as compared to the parents group. This was also reflected in the housing characteristics of the two groups. In additional analysis not reported here, we found that in 2001, 20% of childless women owned their accommodation outright compared to only 11.6% of mothers. The latter were also more likely to rent their homes from local authorities and housing associations (Portanti and Whitworth, 2009).

Childlessness also appeared to be more often associated with presence of a limiting long term illness (LLTI), which we used as a proxy for the health status of respondents. This relationship was present both for the 1991 and the 2001 LLTI variables^x, thus suggesting that on average childless women were in poorer health throughout their adulthood.

Women's ethnicity appeared to have only a very limited association with fertility outcomes. It should be noted however that only 3% of the women in our sample belonged to a "non-white" ethnic group^x. These small sample sizes limited the power of the statistical analysis on the relationship between ethnicity and childbearing outcomes.

Where applicable, lifelong childlessness appeared associated to the characteristics of the partner a woman had when in her mid-thirties, including age and marital status. Childless women were more often in "non-traditional" partnerships, i.e. in non-first marriage relationships. Childless women were particularly more likely than mothers to have been single and cohabiting with a partner who had been married, and had then divorced or become a widower. In some of these relationships, the woman may have acted as a mother to children born in the partner's previous relationship. Childbearing may have played a less central role in these partnerships. However, our analysis could not confirm this hypothesis.

More lifelong childless women than mothers were in a relationship in which there was a wider age gap between partners. This finding confirmed previous qualitative research that suggested that in the childless group, women tend more often to have older partners, sometimes up to 10 years older (McAllister and Clarke, 1998).

Some authors have suggested that childlessness is more common amongst couples who have very similar educational and occupational levels, and thus there is little or no differentiation of roles, interests and activities within their relationship (Hakim, 2003). Therefore, we were expecting to find evidence of a higher presence of educational and/or occupational homogamy within childless women's couples. However, we found no statistically significant evidence to confirm this hypothesis. It should be noted that our analysis of educational homogamy was limited by the little detail on educational qualifications collected at the time of the 1991 Census^{xi}. The education variable that we used only made a distinction between three levels of education: individuals with a (higher) degree; individuals with some qualification attained after the age of 18 but lower than a degree; and people without any educational qualification attained after the age of 18.

Finally, childless women appeared not to have had any sibling in their childhood more often than was the case with those with children. This association was also reported by Kiernan (1989). Further quantitative and qualitative research is required to understand how childhood family's composition impacts on family choices later in adulthood.

Conclusions

Lifelong childless is a growing phenomenon in the UK, with a significant proportion of women in the UK remaining childless throughout their lives. This paper has investigated the extent to which women's lifelong childlessness is associated with their own socio-economic characteristics and, where applicable, to the socio-economic characteristics of their partners.

As the LS is a large-scale nationally representative sample of women and their partners resident in England and Wales, we have been able to test some of the hypotheses that have been suggested elsewhere in the literature on a larger sample than had previously been possible. For

example, as partnership rates are lower in the childless group, other studies have been limited by small sample sizes when analysing women's partners (Hakim, 2005). The longitudinal nature of the LS has also allowed us to analyse women's socio-economic characteristics at different points in time, including early lifecourse variables. While previous research has found mixed evidence on this topic, using the LS we have been able to produce robust statistical results showing the extent to which women's childlessness is associated with some of their own and their partners' socio-economic characteristics. This has helped to gain an understanding of how distinctive childless women are in England and Wales in terms of their own and their partners' socio-economic characteristics.

The analysis and results presented here do not explain all variation in fertility outcomes between women. Compared to survey-based datasources, the range of variables available for analysis in the LS is limited to the variables collected at Census and at

registration. In particular, our data did not cover intentions, opinions, attitudes and values. These are likely to play an important role in explaining why some women remained childless, as other researchers have suggested (for example, Fisher, 1991; Lisle, 1996; McAllister and Clarke, 1998).

Despite these limitations, this analysis still demonstrates the value of using the LS, alongside other established datasources such as the BCS, in future studies of childlessness. The LS is representative of all birth cohorts, thus allowing for more detailed analysis of changes in fertility behaviours over time. Although our analysis concentrated only on the 1956-60 birth cohort, it can be naturally extended to younger cohorts when the data becomes available in the study. Indeed, it will be interesting to investigate whether the observed socio-economic differentials in childlessness remain similar for more recently born cohorts.

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Endnotes

- ⁱ “The Total Fertility Rate (TFR) is the average number of children that a group of women would have if they experienced the age specific fertility rates for a particular year throughout their lives” (Jefferies, 2008, 21)
- ⁱⁱ These countries were as follows: Austria, England and Wales, France, West Germany, the Netherlands, Finland, Norway, Sweden, Italy, Spain, Czech Republic, Estonia, Hungary, Poland, Romania and Slovak Republic.
- ⁱⁱⁱ These countries were as follows: Norway, Sweden, Finland, Belgium, France, Germany, Austria, Switzerland, Italy, Portugal, Spain, Latvia, Lithuania, Poland, Hungary, Czech Republic, Slovenia, Bulgaria, Canada, the USA and New Zealand.
- ^{iv} A detailed description of the LS is offered in the next section of the paper.
- ^v Involuntary childlessness mainly refers to those individual who experience fertility problems. The United Nations World Fertility Survey reported that between 2 and 3% of women aged 25-50 are infertile (Vaessen 1984).
- ^{vi} It should be noted, however, that the usefulness of fertility intentions as fertility predictors has been questioned (Berrington, 2004).
- ^{vii} England and Wales statistics are derived from ONS published figures of average first births per woman estimated using the true birth order process. See FM1 Birth Statistics, table 10.3 and section 2.9.
- ^{viii} Both LS and England and Wales figures refer to births up to December 2005. Women who have not had any live or stillbirth are classified as childless in the LS, while England and Wales figures take into account only live births. England and Wales figures are rounded whereas figures from the LS are not rounded.
- ^{ix} In 1981, a question on health was not included in the Census.
- ^x The sample excluded purposively all immigrants in the UK, unless they immigrated during childhood. See Data and Methods section.
- ^{xi} The 1991 Census only asked respondents to list their qualifications attained after the age of 18. Any qualification attained before that age (e.g. GCSE or A-levels equivalent) would not be listed.