MEASURING FERTILITY WITHIN MARRIAGE BETWEEN 1841 AND 1891 USING PARISH REGISTERS AND THE CENSUS ENUMERATORS' BOOKS

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Introduction

Family reconstitution is familiar to historical demographers as a technique for obtaining estimates of fertility within marriage which are 'unbiased' and reproductive history data with which to analyse birth intervals.[1] The data are rendered 'unbiased' by the application of strict rules governing exactly which marriages are observed. Specifically, only completed marriages of couples who married in the Church of England are used.[2] The 'price' of the unbiasedness is that the resulting fertility rates are based on the experience of only a minority of those who lived within the population to which they refer: the fertility of migrants and nonconformist, for example, is ignored.[3]

In England, family reconstitution (FR) has, in the main, so far been applied to data for the seventeenth and eighteenth centuries. For various reasons, discussed more fully in the next section of this paper, it has been less widely applied to nineteenth century data.[4] For the period after 1850, the only examples we have found are Claire Jarvis's study of three Essex parishes, and Barry Reay's study of three parishes in Kent.[5] The shortage of work on the period after 1850 is especially unfortunate since it was during the second half of the nineteenth century that marital fertility in England began its secular decline. There is currently a debate among demographers about the nature of this decline, and, in particular, about the extent to which it was due to 'stopping' behaviour (by which couples control their fertility once they have had their desired number of children) or to the use of birth spacing.[6] In order to examine this further, it would be useful to have reproductive history data from the second half of the nineteenth century.

This paper will not try to resolve the debate. Its purpose is more modest: to show how data pertinent to the debate might be generated We describe a method by which data from the census enumerators' books (CEBs) can be used in conjunction with data from parish registers in an FR-like procedure.

Using this method, it is possible to obtain both unbiased estimates of marital fertility and reproductive histories for a set of couples who married in an area between 1841 and 1891 and who remained living in the area for some time after their marriage (though not necessarily until the death of one or other spouse). The method is quite simple, and can be applied to many English parishes. The addition of census data enables the fertility of a much greater fraction of marriages to be studied than is the case with FR, notably parts of the marriages of migrants.

The next section of the paper discusses some characteristics of nineteenth century parish register data, and suggests why FR has not generally been carried out for the post-1850 period. We then proceed to describe the proposed method, and to apply it to data from seven parishes in northern Hampshire. Next, we discuss the characteristics of the observed marriages and births, and present some of the results, including estimates of marital fertility for marriage cohorts of 1841–1861 and 1861–1890. Finally, we compare these estimates with those for certain other populations.

Nineteenth century parish register data

FR using nineteenth century parish register data (especially post-1850) faces several obstacles which either are not present, or are present to a lesser degree, in the better-quality parish registers of earlier centuries.

First, the increase in nonconformity and secularity led to a diminishing proportion of vital events being recorded in the Church of England registers. It is fairly clear that in urban areas, in much of Wales and in parts of northern England, a large proportion of births were not recorded in the baptism registers, suggesting that FR would be problematic for those areas.[7]

On the other hand, there is disagreement about the accuracy of baptism registers as a form of birth registration in rural areas elsewhere in England. Most studies of this issue have attempted to measure the proportion of births which went unrecorded in the baptism registers by cross-matching the baptism registers with data from the CEBs for censuses after 1851. In an early study of this type, Peter Razzell found great variability in the proportion of children who could not be found in the baptism registers of the parishes where they had, according to the CEB data, been born.[8] His figures for parishes with less than 1,500 inhabitants ranged from less than 10 per cent to more than 30 per cent, with an average of about 25 per cent.[9] A figure of 27 per cent was recently obtained in a study of seven small parishes in northern Hampshire.[10] However, other studies have found far lower proportions. Claire Jarvis quotes a figure of between six and nine per cent for her Essex parishes, and figures of seven or eight per cent have been reported from the parish of Berwick St James in Wiltshire.[11]

Moreover, there is evidence that some of those who were not baptised in their parishes of birth were children of single mothers who were temporarily

admitted to workhouses, and who consequently appear in the baptism registers of the parishes in which the workhouses were situated.[12] In the baptism register of the Hampshire parish of Old Basing (which contained the Basingstoke Union workhouse), 17 per cent of the 1,708 children baptised between 1841 and 1891 were illegitimate, and the abode of most of these was stated to be the workhouse.[13] However, in other parishes in the Basingstoke Union, fewer than 5 per cent of baptisms were of illegitimate children (for example 4.1 per cent of the 385 baptisms in Ellisfield and 4.6 per cent of the 285 baptisms in Nutley between 1841 and 1891).[14] If this situation was common, then the baptism registers may not be so seriously deficient with respect to births within marriage as they appear to be for all births.

It seems, then, that although the baptism registers in southern and eastern England were sometimes seriously deficient as registers of births, this was not invariably the case. Whereas FR may clearly be carried out for the period after 1850, for it to be successful, a parish must have a baptism register which includes the vast majority of births.

There is in practice a second requirement. The parish must not suffer from a high degree of homonymy (large numbers of people with the same names). The nineteenth-century burial registers hardly ever give information about spouses or relatives of the deceased. Thus one of the links critical to FR, namely that between a burial and an entry in the marriage register, cannot be made reliably if a large proportion of the population has the same name.[15] The difficulty of making this link is compounded by the fact that information about a woman's age at marriage is, in many parishes, limited to whether or not she was 'of full age' (that is 21 years or over), so the age field cannot be used in the linking process. One way of getting round this problem is to use information from the CEBs to confirm the deaths (by looking, for example, to see if the surviving member of the putative couple appears in a subsequent census as a widow or widower), and ages at marriage.[16]

If, however, the CEBs are to be used either to check the reliability of parish registers (a process which assumes that the CEBs are in some sense a 'better' source of data on births than are baptism registers, in that their coverage is superior) or to confirm parts of the FR process which the quality of nineteenth-century parish register data renders uncertain, why not incorporate them fully? It seems rather odd to use the CEBs to show that, say, ten per cent of births in a parish went unrecorded in the baptism register, and then to exclude the data which the CEBs reveal about those ten per cent when estimating fertility rates.

Yet neither of the two post-1850 studies mentioned earlier appears to have incorporated CEB data in this way. Jarvis's study of Essex appears to rely on conventional FR, using the CEBs only for confirming the links made between register entries.[17] Barry Reay, in his study of Kent, mentions the use of 'total reconstitution', and he certainly used CEB data to establish the occupations of bridegrooms and to provide 'some added confirmation of births and deaths'.[18]

However, his description of the data he used for analysing marital fertility suggests that it was obtained using conventional FR.[19] He certainly did not consider the marriages of those who migrated out of his parishes during the study period.[20]

There seem to be two arguments in favour of carrying on with FR even into the era of the CEBs. The first is that the rules of FR mean that it produces 'pure', unbiased measures of the fertility of completed marriages. This is clearly true, but it does not follow that approaches incorporating other sources cannot be devised that will do the same. In this context, 'unbiasedness' simply means that the births in the numerator correspond to the exposed-to-risk in the denominator. Ensuring that this is the case is an actuarial exercise, not some kind of magic that only FR can perform.

Second, it has been argued that the results will only be comparable over time if the methods used in late nineteenth century studies are the same as those used in work on earlier periods.[21] The most obvious response to this is to appeal to the uniqueness of the 'pure' or unbiased measures. If FR produces unbiased measures of fertility, then these must logically be comparable with unbiased measures of fertility produced by another method.

This objection cannot be dismissed quite so easily, though. Demographic measures which FR produces only relate to a subset of the population of any place, which may be described loosely as an immobile (or non-migratory) minority. Even if other approaches produce unbiased measures, they may not relate to the same subset of the population, and thus may not be comparable with measures based on the FR rules. The proposed method, however, starts from FR and then adds more data. The set of marriages observed in FR is a subset of those observed using the proposed approach, so results based on the 'FR marriages' can be generated quite easily if desired for comparative purposes.

The method

When studying marital fertility using FR, a subset of the marriages recorded in the Church of England registers for a particular parish is observed. This subset comprises marriages for which the deaths of both spouses are recorded at some later date in the burial register for the parish in question. It is assumed that the couples in these marriages resided in the parish throughout their married life, and hence that any children born to these marriages will be recorded in the parish baptism register during the intervening period. This restriction thus preserves the principle that the events in the numerator and the 'exposed to risk' in the denominator of demographic rates should correspond.

The proposed extension may best be described as augmenting the subset of marriages which are observed to include all those in which the couple remained living in the parish in which they married for some time after their marriage. The minimum period of residence which will allow a couple to be admitted to observation is that between the marriage and either the death of the first spouse to die, or the first census after the marriage (whichever of these is

the shorter).

Identification of period of observation for each marriage

The method used to identify the period of observation for each marriage involves several stages. It is described as if for a single parish, but it can be applied equally to contiguous groups of parishes.

1. The initial sample comprises all first marriages recorded in the marriage register between June 1841 (when the 1841 census was taken) and April 1891 (when the 1891 census was taken).

2. Each entry in the marriage register is compared with the burial register for the period between the date of the marriage and the next census. If an (apparently) matching entry is observed in the burial register, the CEB for the next census is searched to see if the surviving spouse appears as a widow. If so, the period of observation for that marriage is defined to be that between the date of marriage and the date of burial of the deceased spouse. If entries matching both spouses appear in the burial register, then, provided there is no record in the next census that could possibly refer to either spouse, we observe the marriage between the date of the marriage and the date of the earlier entry in the burial register.

3. The remaining entries in the marriage register are then linked to the CEB for the next census after each marriage. Those marriages in which both spouses appear in the CEB and are stated to be husband and wife are regarded as observed from the date of the marriage until the date of the immediately succeeding census.[22]

4. All marriages for which no period of observation is defined in stages 2 and 3 are eliminated from the sample.

5. For each marriage observed until the first census after the date of marriage, stages 2 and 3 are repeated, replacing the entry in the marriage register by the entries for husband and wife in the first census after their marriage. Attempts are made to match these 'first census' entries with entries in the burial register during the next intercensal interval and in the second census after the date of marriage. Application of this procedure identifies a period during the next intercensal interval for which each of these marriages is observed. All marriages for which such a period cannot be identified are regarded as observed only until the date of the first census after the marriage.

6. For each marriage observed in the second census after the date of marriage, stage 5 is repeated for the third and subsequent intercensal intervals, until the 1891 census is reached.

Application of this procedure produces, for a subset of the marriages recorded

in the register between June 1841 and April 1891, a continuous period of observation starting at the date of the marriage, and ending at one of two dates: the date of burial of the first spouse to die, or the date of the last successive census up to 1891 in which both spouses appear. Thus we have marriages which are either complete, or 'right-censored'. Right-censoring is an important concept in the analysis of birth history data. When a marriage is right-censored it means that we only observe the first few years of the marriage. The marriage continues for an unknown further period after the couple passes out of our observation. Using such a sample of marriages will produce measures of fertility which can be compared with those obtained from FR provided that the censoring processes are independent of the childbearing process. There are two censoring processes at work in our sample: one is the arrival of the fixed date of 1891, and the second is migration out of the parish. The first of these may be assumed to be independent of the childbearing process. The validity of assuming that out-migration and childbearing are independent is more questionable.[23] It is possible to look at this issue in more detail by comparing the fertility in the first few years of 'complete' marriages with fertility over the same marital duration for out-migrants (see below).

Next, we estimate the age at marriage of each wife in this subset. Because marriage registers frequently only indicate whether or not the wife was 'of full age', the age information in the CEBs and/or the burial register must be used in addition. These two sources produce, for each observed marriage, at least one record which gives the age of the wife in years. Using all such records, we can estimate each wife's year of birth. Where a woman has more than one record giving her age, we take the average (ignoring outliers), and assume that the wife was born on 30 June in that year. Clearly, this is an approximate procedure. However, in view of the accuracy with which ages were reported in nineteenth century censuses, we do not think that any more accurate (and time-consuming) method is justified.[24]

Having worked out the wife's date of birth in this way, we censor the period of observation of all marriages at the (estimated) date of the wife's 50th birthday, if it is not censored for some other reason at an earlier date.

Identification of births occurring during the period of observation

Two sources of data may be used to compile a list of all births occurring to each observed marriage during the period of observation. First, the baptism register records the dates of baptism of all children of each marriage baptised during the period of observation. Second, the CEBs give the ages and places of birth of all children who survived to the relevant census dates. Clearly, many of the entries in the CEBs relate to the same children as do entries in the baptism register. However, a minority of children who appear in the CEBs and whose ages and places of birth imply that they were born in the parish in question during the period of observation typically do not appear in the baptism register, and children who were baptised and who did not survive

until the next census are not recorded in the CEBs. The sample of births we include in the analysis consists of the union of the two sets of births. Checks for consistency were made (for example, birth intervals of fewer than nine months were identified) and the sample adjusted where necessary.

For children whose baptism was recorded in the baptism register, we took the date of baptism as the estimated date of birth (unless the register gave a date of birth, or an age at baptism). Clearly, birth-baptism intervals pose a potential problem for this approach. However, previous work on nineteenth century baptism registers indicates that the majority of birth-baptism intervals were fairly short. Dewhurst and Hinde's analysis of the birth-baptism interval in Hampshire between 1851 and 1891, for example, indicates that 75 per cent of baptisms took place when the child was aged less than nine weeks, and 90 per cent when the child was aged less than three months.[25] The ages at baptism of children who were unusually old when they were baptised are also often noted in baptism registers. For children identified solely from the CEBs, we estimated dates of birth using a procedure similar to that for estimating each woman's age at marriage.[26]

The combination of the baptism register and the CEBs enables us to observe the majority of the children born to each marriage during the period of observation. In order not to be observed, a child has both to fail to appear in the baptism register and to be unrecorded in the household of their parents at the date of the next census. Although it is known that some children were brought up for periods outside their parental household, the most common reason for a child being missing from the next census will probably be that he or she died before the census date. If we suppose that 25 per cent of all births were not recorded in the baptism register of their parish of birth, and that about 15 per cent of the children born during an intercensal interval did not survive until the next census, then the number of births omitted is just under five per cent.[27] A figure of 25 per cent of births omitted from the baptism register is probably on the high side (especially if illegitimate children were far more likely to have been baptised outside their parishes of birth than were legitimate children). Thus five per cent is probably an overestimate of the proportion of births to observed marriages which are missing.[28]

It is clear that some of these omitted births could be observed in the burial register. However, we have not searched the burial register because the information given therein is insufficient to enable us to match the entries for dead children to particular marriages with confidence.[29]

An application to rural Hampshire

We have applied the method described in the previous section to data from seven rural parishes in northern Hampshire: Cliddesden, Dummer, Ellisfield, Farleigh Wallop, Nutley, Old Basing and Winslade with Kempshott.[30] These parishes lie in an arc to the south and east of the (then) market town of Basingstoke. They were largely agricultural throughout the period from 1841 to 1891, although the London and South Western Railway ran through the

parish of Old Basing, and employed a minority of the population of that parish. We treated the group of seven parishes as a single entity: couples married in any one of the parishes were traced in the subsequent CEBs and burial registers for all seven parishes, and the baptism registers for all seven were searched to identify the children born to those marriages. The total population of the seven parishes was around 2,500, and changed little between 1841 and 1891.

In all, 348 marriages were traced for at least some period after the date of the marriage. These marriages represent 46 per cent of the total of 753 marriages recorded in the marriage registers of the parishes between 1841 and 1891. The observed marriages can be classified according to the reason why observation ceased. We observed 85 marriages (24 per cent of the total) until the wife's 50th birthday. A further 58 (17 per cent) were censored by the death of one spouse prior to the wife's 50th birthday. One third of the marriages (116 in total) were censored because the couple had (apparently) moved away from study area, and the remaining 89 (26 per cent) were censored in 1891. Despite a certain amount of arbitrariness about this classification of the observed marriages, it is clear that we observe a substantially greater proportion of marriages using our approach than we would if we used conventional FR.

It is worth looking at the characteristics of these four groups of marriages in a little more detail (Table 1). Those women whose marriages were observed until their 50th birthday married, on average, three or four years older than did women whose marriages were ended by a death prior to the woman's 50th birthday, or who migrated out of the study area. Women whose marriages were censored by the 1891 census married at the youngest average age of the four groups. This last observation is unsurprising, being largely the product of a selection effect: women who marry at young ages are more likely to see their marriages survive until 1891 than women who marry at older ages. To eliminate the distortions caused by the end of the period of observation, we can look just at marriages which took place in the period 1841–1861.[31] This effectively eliminates the possibility of censoring in 1891. Even in this subsample there are differences among the three remaining groups, although they are less than in the whole sample (Table 1). Again, earlier marrying women have more time for the two decrements of migration and death to act prior to their 50th birthday, and thus are more likely to have the observation of their marriages ended for these two reasons. This is another selection effect.

Of the 348 brides we observed, about 30 per cent were pregnant when they married.[32] The proportion of brides who were pregnant varied according to the age at marriage. It was 38 per cent for women marrying at ages 20–24 years, but less than 15 per cent for women marrying at ages more than 30 years. If we restrict attention to those women who had at least one birth after marriage, we find that 38 per cent conceived their first post-marital birth before they married. This is very close to the figure of 40 per cent observed in the Buckinghamshire parish of Medmenham by P. E. H. Hair.[33]

In all, we observed 1,285 births to the 348 marriages during the period of

Table 1   Average age at marriage according to reason for termination of observation

Years of marriage		Reason for termination of observation			
		Death	Migration	Censoring in 1891	Woman's 50th bithday
1841–1891	Mean	24.1	23.3	22.5	27.4
	Median	22.0	22.3	21.5	24.5
	IQR	5.9	4.8	3.8	13.5
	N	58	116	89	85
1841–1861	Mean	24.3	23.3	– –	26.0
	Median	21.7	21.4	– –	23.3
	IQR	7.6	7.0	– –	10.1
	N	40	58	1	70

Note: 'IQR' – Inter-quartile range.

Sources: Hampshire Record Office, Parish registers for Cliddesden, 31M82/PR4–5, 8–9; Dummer, 65M72/PR 5–6, 9–10; Ellisfield, 66M72/PR3, 6–7; Farleigh Wallop, 67M72/PR1, 4–5; Nutley, 56M69/PR1, 4, 6; Old Basing, 3M70/PR5, 7–10; and Winslade with Kempshott, 85M82/PR2, 5–6. Public Record Office, Census enumerators' books, Cliddesden, Dummer, Ellisfield, Farleigh Wallop, Nutley, Old Basing and Winslade with Kempshott, 1851: HO 107/1681; 1861: RG 9/709 and 711; 1871: RG 10/1235 and 1237; 1881: RG 11/1255 and 1257; 1891: RG 12/958 and 960.

observation. Of these, 1,239 were to women aged 20 years and over. The proportion of births which were identified solely from the appearance of the child in a census was 13.3 per cent. These 'census-only' births were evenly distributed across the birth orders. There were clearly some couples who did not baptise the majority of their children at any of the parish churches for which we examined the registers. There were also many couples for whom just one or two births (out of, say, six of more) were missing from the baptism register but present in one or more of the censuses.

Age-specific marital fertility rates (ASMFRs) for five-year age groups are calculated by dividing the number of births to women in an age group by the number of woman-years of exposure within that age group. The ASMFRs for the whole sample of marriages are shown in Table 2. These ASMFRs, and all those reported in subsequent tables, incorporate a correction for bridal pregnancy. This correction involves 'artificially' backdating the marriages of women whose first post-marital birth occurred less than eight months after their marriage by 12 months.[34]

The total marital fertility rate (TMFR) between ages 20 and 49 was 7.5. Also shown in Table 2 are ASMFRs for certain other populations in the nineteenth century, and for England as a whole in earlier centuries. Our northern

Table 2   Age-specific marital fertility rates (ASMFRs) for northern Hampshire and for se-

Population	Age of mother						Total marital fertility rate
	20–24	25–29	30–34	35–39	40–44	45–49	
7 parishes in northern Hampshire, 1841–1891	0.368 (786)	0.359 (1,008)	0.329 (880)	0.251 (713)	0.133 (603)	0.026 (502)	7.3
14 English parishes, 1550–1849	0.383	0.350	0.304	0.243	0.134	0.028	7.2
German villages, 1850–1874	0.533	0.450	0.362	0.288	0.128	0.015	8.9
3 Kent parishes, 1850–1864	0.481	0.361	0.315	0.260	0.162	0.020	8.0

Note: Figures in brackets denote the number of woman-years of exposure on which the ASMFRs for each age group are based.

Sources: For Hampshire parishes, see Table 1. Figures for 14 English parishes, 1550–1849 from C. Wilson, 'Natural fertility in pre-industrial England', *Population Studies,* **38**(1984), Table 2, 228; German villages from J.E. Knodel, *Demographic behaviour in the past: a study of fourteen German village populations in the eighteenth and nineteenth centuries*, (Cambridge, 1988), Table 10.2, 257; three Kent parishes from B. Reay, 'Before the transition: fertility in English villages, 1800-1880', *Continuity and Change*, **9**(1994), Table 3, 100.

Hampshire parishes exhibit marital fertility levels very similar to those reported from FR studies in England between 1550 and 1849. However, they are lower than those found by Barry Reay in Kent during the second half of the 19th century (also using conventional FR). On the other hand, the TMFR in northern Hampshire is similar to that of 7.0 reported for three Essex parishes between 1800 and 1880 by Claire Jarvis.[35]

In order to examine trends across marriage cohorts, we divided the observed marriages into two roughly equal groups, those taking place in 1841–1860, and those taking place in 1861–1891. The TMFR in the two marriage cohorts was much the same, but there was a change in the pattern of the ASMFRs, with fertility increasing over time for women in their twenties, and declining for women aged more than 35 (Table 3, rows 1 and 2). This pattern is similar to that reported by Barry Reay for three Kent parishes, when comparing marriages between 1850 and 1864 with those between 1865 and 1880, and by John Knodel

Table 3 Marital fertility in northern Hampshire by date of marriage **and age at marriage**

Date of marriage	Age at marriage	Age of mother						Total-marital fertility rate
		20–24	25–29	30–34	35–39	40–44	45–49	
1841–1861	All ages	0.337	0.342	0.327	0.281	0.136	0.026	7.2
1861–1891	All ages	0.398	0.377	0.332	0.193	(0.126)	(0.026)	7.3
1841–1891	Under 22.5 years	0.368	0.355	0.316	0.273	0.186	0.038	– –
1841–1891	22.5 years and over	0.370	0.364	0.345	0.230	0.090	0.017	– –
1841–1861	Under 22.5 years	0.335	0.329	0.315	0.289	0.184	(0.032)	– –
1841–1861	22.5 years and over	– –	0.371	0.343	0.273	0.087	(0.020)	– –
1861–1891	Under 22.5 years	0.403	0.390	(0.317)	(0.232)	– –	– –	– –
1861–1891	22.5 years and over	– –	0.358	(0.348)	(0.168)	(0.094)	– –	– –

Note: Unbracketed figures are based on more than 200 woman-years of exposure. Figures in brackets are based on between 100 and 200 woman-years of exposure. Figures based on fewer than 100 woman-years of exposure are not quoted.

Sources: See Table 1.

for 14 German parishes when comparing the marriage cohorts of 1850–1874 and 1875–1899.[36]

One interpretation of this pattern is that it represents the sum of two distinct trends in marital fertility, an increase in underlying fertility, and the increasing practice of family limitation.[37] However, previous work has shown that English marital fertility in the past varied with marital duration as well as age. At all ages, later marrying women have higher ASMFRs than earlier marrying women.[38] Thus it is possible that the pattern also reflects a change in the distribution of ages at marriages between the two marriage cohorts. The mean age at marriage for those marriages prior to 1861 was 24.6 years, and for those between 1861 and 1891 it was 23.8 years. More significantly, the proportion of marriages in the age group 20–24 years was 41 per cent for the 1841–1860 marriage cohort and 55 per cent for the 1861–1891 marriage cohort.

To explore this in more detail, we divided the marriages in our sample into two groups: those where the wife was aged less than 22.5 years when she married, and those where the wife was aged 22.5 years and older. The ASMFRs for the two groups (Table 3, rows 3 and 4) exhibit some differences, but the rates for the older marrying women are not systematically higher than those for the younger marrying women (indeed, at ages more than 35 years they are

Table 4   Age specific marital fertility rates for subsequent migrants and for 'stayers'

	Age of mother					
	20–24	25–29	30–34	35–39	40–44	45–49
'Stayers'	0.336	0.361	0.331	0.244	0.127	0.024
Subsequent migrants	0.355	0.315	(0.301)	– –	– –	– –

Note: See Table 3. 'Stayers' include women whose marriages were observed until the death of either spouse, or until the woman's 50th birthday.

Sources: See Table 1.

quite a bit lower). We have also estimated ASMFRs for subgroups classified according to both marriage cohort and age at marriage (Table 3, rows 5–8), though small numbers mean that the results should be interpreted with caution. The increased fertility at aged 20–24 years between the 1841–1860 and 1861–1891 marriage cohorts appears to be unrelated to changes in the age at marriage. At ages 25–29 there is a complex pattern, with the rates increasing for the early marrying women but remaining about the same for later marrying women. The decrease in fertility at ages 35–39 between the two marriage cohorts seems to be due partly (but only partly) to changes in the age at marriage.

Finally, we can compare the fertility of couples who subsequently out-migrated with that of couples whose marriages were observed until the woman's 50th birthday or until a death ended the marriage (Table 4). Women who were subsequently to migrate out of the study area had somewhat lower fertility at ages 25–34 years than those who were to stay in the area until either their 50th birthday, or their death, or the death of their husband. This impression of lower fertility for subsequent migrants is confirmed by an examination of the distributions of the number of children born in the first five years, and the first ten years, of marriages in the two categories. One reason for the lower fertility of the migrants seems to lie in the higher proportion of migrant couples who were childless. After five years of marriage, 19 per cent of couples who would subsequently migrate were still childless, compared with 13 per cent of those whose marriages would be observed until death or the woman's 50th birthday ('stayers'). After ten years of marriage, the corresponding figures were 11 per cent (for subsequent migrants) and one per cent (for 'stayers').[39] These differences between migrants and 'stayers' suggest that the assumption that migration and childbearing are independent of one another, which is necessary if the results of our procedure are to be comparable to those of FR, is questionable. This needs to be examined further.

Conclusion

We hope to have shown in this paper that the use of parish registers and the CEBs in combination enables us to estimate age-specific marital fertility schedules for English populations between 1841 and 1891. While our method would benefit from certain refinements, notably in connection with the estimation of dates of birth, we do not believe that these would greatly affect the results we have presented. The combination of CEB and parish register data to analyse birth histories in late nineteenth century rural England offers considerable potential for future research. One obvious avenue to pursue is the use the occupational data in the CEBs and baptism registers to look at variations in fertility between different social and economic groups. However, the greatest returns are likely to be achieved by analysing the birth histories themselves. The method we have outlined generates, for each marriage, a set of dates starting with the date of the marriage and including the dates of birth of each subsequent child. These 'reproductive histories' are ideal data with which to examine the extent of 'stopping' and 'spacing' behaviour. There is an urgent need for such data at the present time, as the debate about 'stopping' and 'spacing' mentioned in the introduction to this article has hitherto been conducted in the absence of the kind of true reproductive history data which would allow the various arguments to be tested rigorously.

Our results for northern Hampshire show that marital fertility in the late-nineteenth century was similar, in both its level and its age pattern, to that observed for England as a whole in earlier centuries using FR data. There is also evidence to confirm the observations made by earlier studies of Kent and Germany, that a shift in the age pattern of marital fertility towards the younger age groups was occurring between 1841 and 1891. Although shifts in the distribution of ages at marriage might explain part of this pattern, it is also possible that it reflects the onset of family limitation, combined with a rise in the underlying level of fertility.

Acknowledgements

NOTES

1. Demographic rates are ratios of occurrences of events (for example births) divided by populations at risk of experiencing those events (for example married women). By 'unbiased' is meant that if a woman is included in the exposed-to-risk in the denominator, and she experiences a birth during the relevant time period, then that birth must be included in the numerator. Conversely, if a woman experiences a birth during the relevant time period, and that birth is included in the numerator, then the woman must be included in the exposed-to-risk in the denominator.

2. On the rules governing observation, see E.A. Wrigley, 'Family reconstitution', in E.A. Wrigley ed., *An introduction to English historical demography*, (London, 1966), 96–159; and E.A. Wrigley and R.S. Schofield, 'Nominative record linkage and the logic of family reconstitution', in E.A. Wrigley ed., *Identifying people in the past*, (London, 1973), 64–101.

3. On the limitations of family reconstitution, see S. Ruggles, 'The limitations of English family reconstitution: English population history from family reconstitution 1580-1837', *Continuity and Change*, **14** (1999), 105-30. This article is a review of the most important study using family reconstitution on English data: E.A. Wrigley, R. Davies, J. Oeppen and R.S. Schofield, *English population history from family reconstitution, 1580–1837*, (Cambridge, 1997).

4. Wrigley, Davies, Oeppen and Schofield, *English population history from family reconstitution*, includes results from some early nineteenth century reconstitutions, but they are few in number compared with those for the preceding centuries. One FR study which does deal extensively with the early nineteenth century is D. Levine, *Family formation in an age of nascent capitalism*, (New York, 1977).

5. C. Jarvis, 'The reconstitution of nineteenth century rural communities', *Local Population Studies*, **51**(1993), 46–53; B. Reay, 'Before the transition: fertility in English villages, 1800–1880', *Continuity and Change*, **9**(1994), 91–120 (reprinted in B. Reay, *Microhistories: demography, society and culture in rural England, 1800–1930*, (Cambridge, 1996): all page references in subsequent notes are to the *Continuity and Change* version).

6. For more on this debate, see E.M. Garrett and A. Reid, 'Thinking of England and taking care: family building strategies and infant mortality in England and Wales, 1891–1911', *International Journal of Population Geography*, **1**(1995), 69–102; S. Szreter, *Fertility, class and gender in Britain, 1860–1940*, (Cambridge, 1996), 367–439; M. Anderson, 'Highly restricted fertility: very small families in the British fertility decline', *Population Studies*, **52**(1998), 177–99; and E. Garrett, A. Reid, K. Schürer and S. Szreter, *Population change in context: place, class and demography in England and Wales, 1891-1911*, (Cambridge, forthcoming).

7. For example, H.R. Davies, 'Automated record linkage of census enumerators' books and registration data: obstacles, challenges and solutions', *History and Computing*, **4**(1992), 22, found that only eight per cent of the births recorded in the civil birth register for the Welsh parish of Llanuwchllyn for the period 1841–1881 were recorded in the baptism registers.

8. P. Razzell, 'The evaluation of baptism as a form of birth registration through cross–matching census and parish register data: a study in methodology', *Population Studies*, **26**(1972), 121–46 (reprinted in P. Razzell ed., *Essays in English population history*, (London, 1994), pp. 82–118). See also Razzell's paper in this issue of *Local Population Studies*. Razzell's method has been criticised, but he has recently responded to the criticism and reaffirmed his estimates: see Razzell, *Essays*, 119–49.

9. Razzell, *Essays*, Table 6, 92–3.

10. S. Dewhurst and A. Hinde, 'Age at baptism in rural Hampshire in the second half of the nineteenth century', *Local Population Studies*, **57**(1996) 73, 75. Dewhurst and Hinde's seven parishes only include two of the seven parishes studied in this paper.

11. Jarvis, 'The reconstitution', Table 1, 48 and 50; P.R.A. Hinde, 'The population of a Wiltshire village in the nineteenth century: a reconstitution study of Berwick St James, 1841–1871', *Annals of Human Biology*, **14**(1987), Tables 1 and 2, 479. P.E.H. Hair, 'Bridal pregnancy in earlier rural England further examined', *Population Studies*, **24**(1970), 62, writing of the parish of Medmenham, Bucks., says that 'parish registers may be almost as comprehensive a record for the Victorian period as for any earlier period'.

12. According to F. Turnbull and A. Hinde, 'The populations of two Hampshire workhouses, 1851–1861', *Local Population Studies*, **61**(1998), 48–9, pregnant unmarried women often entered workhouses shortly before they were due to give birth in order to take advantage of the workhouses' 'lying-in' facilities. However, they typically only stayed for a short period, discharging themselves fairly soon after the birth took place.

13. Hampshire Record Office, Winchester, (hereafter HRO), Old Basing baptism register, 3M70/PR5, 8, 10.

14. HRO, Ellisfield baptism register, 66M72/PR3; Nutley baptism register, 56M69/PR1.

15. The problem of homonymy can be overcome using complex computer algorithms, but the effort involved is substantial. See Davies, 'Automated record linkage', 22–5 and H.R. Davies, 'Nominal record linkage of historical data: procedures and applications in a north Wales parish', (unpublished Ph.D. thesis, University of Southampton, 1994).

16. See Reay, 'Before the transition', 97.

17. Jarvis, 'The reconstitution', 50–2.

18. Reay, 'Before the transition', 92, 97, 119.

19. Reay, 'Before the transition', 94–5.

20. Reay, 'Before the transition', 95.

21. Jarvis, 'The reconstitution', 47.

22. The need to have information about marital status in the CEBs makes the use of the CEBs for the 1841 census more difficult than those of subsequent censuses, since marital status is not given, and we have not used them here.

23. Note that the method does not use the information about place of residence given in the baptism register in the identification of the period for which each marriage is observed. Doing this would clearly lead to a violation of the assumption of independent censoring.

24. Ages were frequently misreported, though individual errors were not often large. See K. Schürer and D. R. Mills, 'Population and demography', in D. Mills and K. Schürer, eds, *Local communities in the Victorian census enumerators' books*, (Oxford, 1996), 74-9; and A. Perkyns, 'Age checkability and accuracy in the censuses of six Kentish parishes, 1851-1881', *Local Population Studies*, **50** (1993), 19-39 (reprinted in Schürer and Mills, *Local communities*, 115-34).

25. Dewhurst and Hinde, 'Age at baptism', Table 1, 74.

26. In censuses up to 1881, enumerators were told to write down the ages as they were reported to them. From 1881, ages in completed years (i.e. 'last birthday') were asked for. E. Higgs, *Making sense of the census: the manuscript returns for England and Wales, 1801–1901* (Public Record Office handbook 23), (London, 1989), 69, mentions a tendency to think of the ages of children in 'age next birthday' terms. We followed Dewhurst and Hinde, 'Age at baptism', 75 and assumed that the age as reported in the census was an exact age, which amounts to an 'age nearest birthday' assumption. Clearly, the three methods of reporting ages (i.e. in 'last birthday', 'nearest birthday' or 'next birthday' terms) imply different estimated dates of birth.

27. The figure of 25 per cent is based on Dewhurst and Hinde, 'Age at baptism', 73. The figure of 15 per cent for mortality is estimated from model life tables.

28. It might be argued that the birth histories of families with any children identified only from the CEBs are potentially problematic. If this is thought to be the case, then it is possible to use in analysis only those families whose children were all identified from the baptism registers. Note that this does not mean going back to conventional FR, as we can still use the marriages of subsequent out-migrants.

29. Jarvis, 'The reconstitution', 50, points out, correctly, that 'it is possible to insert burials without previous baptisms tentatively into family groups'. However, she admits that her ability to do

this relies on the number of marriages analysed being small, and the range of names in use being 'relatively large'. In our study, we found quite a large number of contemporaneous marriages with the same surname, and so did not feel comfortable in following this procedure.

30. HRO, Parish registers for Cliddesden, 31M82/PR4–5, 8–9; Dummer: 65M72/PR 5–6, 9–10; Ellisfield: 66M72/PR3, 6–7; Farleigh Wallop: 67M72/PR1, 4–5; Nutley: 56M69/PR1, 4, 6; Old Basing: 3M70/PR5, 7–10; and Winslade with Kempshott: 85M82/PR2, 5–6. Public Record Office, Census enumerators' books, Cliddesden, Dummer, Ellisfield, Farleigh Wallop, Nutley, Old Basing and Winslade with Kempshott, 1851: HO 107/1681; 1861: RG 9/709 and 711; 1871: RG 10/1235 and 1237; 1881: RG 11/1255 and 1257; 1891: RG 12/958 and 960.

31. When subdividing the sample in this way, the number of marriages we observe becomes rather small, so the results should be interpreted with caution.

32. This figure has been calculated by assuming that all brides who had a child baptised within nine months of the date of their marriage were pregnant when they married. The denominator also includes a few women whose marriages were not observed for nine months. Since some women having a child eight months after their marriage might have conceived that child after marriage, we probably slightly over-estimate the proportion of brides who were pregnant.

33. Hair, 'Bridal pregnancy', 62.

34. C. Wilson, 'Natural fertility in pre-industrial England', *Population Studies*, **38**(1984), 232.

35. Jarvis, 'The reconstitution', Table 4, 52.

36. Reay, 'Before the transition', Table 3, 100; J.E. Knodel, *Demographic behaviour in the past: a study of fourteen German village populations in the eighteenth and nineteenth centuries*, (Cambridge, 1988), Table 10.2, 257.

37. Knodel, *Demographic behaviour*, 254–63; Reay, 'Before the transition', 107.

38. E.A. Wrigley and R.S. Schofield, 'English population history from family reconstitution: summary results 1600–1799', *Population Studies*, **37**(1983), Tables 9 and 10, 173–4; Wrigley, Davies, Oeppen and Schofield, *English population history from family reconstitution*, Table 7.15, 399.

39. The comparison after ten years of marriage is based on small numbers, so the results should be interpreted cautiously.