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Two textile townships, c. 1660-1820: a comparative demographic analysis[1]

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Since Wrigley and Schofield's classic work of 1981, it has been generally accepted that the sustained population acceleration in England and Wales in the eighteenth century resulted from earlier and more universal marriage. This was in turn taken to reflect a response to rising income levels coupled with social changes, such as the decline of live-in farm service and apprenticeships which had delayed the setting up of new households.[2] Our subsequent understanding has been enriched by historians who have placed stress upon European-wide stimuli to earlier courtship and marriage, and hence to increases in fertility, especially the greater mobility and economic and sexual freedoms of young people resulting from the processes of proletarianization and proto-industrialization.[3] Such causal analysis and model building at national and supranational levels have been invaluable but they pose fundamental questions about the dynamics of population change in varied regional and local environments.[4] Understanding the diversity of experience behind aggregate indices and averages of vital variables calls for complementary research looking at regional and local patterns, at the distributions (as well as the means) of demographic variables, and at individual experiences. By digging beneath the surface of aggregate indicators, and by making more direct and immediate connections between the processes of economic, social, cultural, and demographic change, it is possible to uncover worlds of cause and effect very different from those which satisfy the aggregated variables and which dominate the large-scale causal analyses.

In western Europe as a whole, geographical variations in demographic

[1] Earlier versions of this article have benefited from exposure at the Eighth International Economic History Conference, Madrid, 1998, and at seminars at the Cambridge Group for the History of Population and Social Structure and All Souls College, Oxford. We are grateful to the seminar participants for their helpful comments. The research upon which the article is based forms part of a larger project on economic, social, and cultural change in industrializing West Yorkshire, elements of which have been financed during the past decade by the ESRC, the British Academy, the Nuffield Foundation, and the Leverhulme Trust.

[2] Wrigley and Schofield, *Population history*. This analysis owed much to ideas about the prevalence of the nuclear family since preindustrial times, originally aired by Hajnal, 'European marriage patterns', Laslett, *World we have lost*, and *idem*, *Household and family*, 'Introduction'. For a rebuttal which places much more emphasis on declining mortality, see Razzell, 'Conundrum'.

[3] Seccombe, *Millennium of family change*; Levine, *Family formation; idem*, *Reproducing families*.

[4] Wrigley and Schofield highlighted this need as part of their future agenda in 1981: *Population history*, pp. 9-10. It was also stressed early by Drake, *Population history*, and endorsed by Hudson, *Regions and industries*, pp. 11-13 and by Wrightson and Levine, *Poverty and piety*.

indicators were always greater than temporal variations between the sixteenth and eighteenth centuries, suggesting that it is vital to consider spatial differences and their causes.[5] Levine pointed a way forward by stressing the potential importance of occupational determinants and by suggesting that the English demographic regime contained several demographic response patterns working alongside one another in differently weighted combinations over time and space: the peasant, the proletarian, and the proto-industrial.[6] Seccombe refined this type of model in a European context but questioned any *inevitable* link between proletarianization and changing demographic behaviour. He argued that there was a difference between demographically damaging or insignificant 'negative proletarianization', caused by displacement from the land, and 'positive proletarianization' which stimulated the take-off in population growth rates after 1750 because it was accompanied by a commensurate rise in waged work opportunities.[7]

The recent collective analysis of 26 reconstitution studies by the Cambridge Group has also been partly concerned to highlight variations in experience. Certain typologies of demographic change are suggested, associated with 'agricultural', 'retail trade and handicrafts', and 'manufacturing' communities.[8] Although only a small sample (8, 5, and 3 respectively of each economic group), these parish types appear to have differed markedly from each other in nuptiality levels and in other demographic experiences between the seventeenth century and the nineteenth. Adair has analysed variations in bastardy in the period 1538-1754, suggesting that here, too, there were distinct and enduring regional differences in the nature of courtship and in attitudes both to premarital sex and to marriage.[9] Szreter's study of the late nineteenth-century demographic transition further illustrates the enduring nature of regional and social variations in demographic behaviour in England: far from being a 'unitary and unifying' event, the fertility decline in Britain was one of 'fundamental cultural and socio-demographic diversity'.[10]

Explaining varied experiences is no easy task. Continental scholars have successfully used 'micro-history' to question macro-level connections between demographic and economic change, and to try to identify more precisely the stimuli and motivations affecting behaviour in different

[5] A point made by Seccombe, 'Marxism and demography'.

[6] Levine, 'Population history'. Occupational variations had already been demonstrated empirically in Flinn, *European demographic system*. Levine, *Reproducing families; idem*, 'For their own reasons'; *idem*, 'Asymmetrical, non-linear population dynamics'; *idem*, 'Proletarian family'.

[7] Seccombe, *Millennium of family change*.

[8] Wrigley et al., *English population history*. These categories are defined according to the concentration of employment by sector at the time of the 1831 census. But this census enumerated only the employments of men over 20 years under seven specific headings. It is thus a rather blunt instrument with which to measure dominant occupations in the early nineteenth century, let alone during the previous century and earlier.

[9] Adair, *Courtship, illegitimacy and marriage*. These sorts of regional and local differences in illegitimacy have been identified by others including Blaikie, *Illegitimacy, sex and society*; Laslett et al., *Bastardy*; Sabean, *Power in the blood*.

[10] Szreter, *Fertility, class and gender*, pp. 533, 539-40.

communities.[11] But relatively little is still known about when and how inter-generational relationships, relationships between the sexes, the courtship process, and marriage ages were affected by real wage shifts, proletarianization, manufacturing employments, or changes in poor relief policies, especially in Britain.[12] And, although the question has been raised many times, gender-specific demographic reactions to broader cultural and economic changes have rarely been researched, despite sufficient evidence to suggest that female motivations in courtship and marriage were often very different from those of men.[13]

The seemingly close relationship between proto-industrialization, proletarianization, and the breakdown of 'traditional' ways of life, including demographic behaviour, as argued so forcefully by Levine, Mendels, and others, is particularly ripe for some local-level rethinking in the British context.[14] European studies over the past two decades reveal that the economic, social, and demographic consequences of rural manufacturing and of proletarianization varied widely. Increased manufacturing and expanding trade were often compatible, rather than in conflict, with normative social relations and ways of life at local level. Vardi, for example, has shown that the linen industry of the Cambresis arose from a response of substantial peasant weavers to additional income-earning opportunities which fitted in with their existing agrarian culture.[15] Tilly,

[11] The literature on European communities is considerable. Schlumbohm gives a survey and a contribution in 'Micro-history and the macro-models'. See also NEHA, *Economic and social history*, and *J. Family Hist.*, 16 (1991), special issue on European marriage patterns. The term micro-history has started to be used to describe such studies, although originally micro-history was much more closely associated with detailed biographical or ethnographical work by Italian scholars in particular. What the two very different types of micro-history have in common is the use of small-scale study to ask big questions. For wider discussion of the role of micro-history, see Levi, 'On micro-history'. For broader views of the value of an analytical local history, see Phythian-Adams, 'Local history and societal history' and Marshall, *Tyranny of the discrete*. For a recent example of a demographically oriented micro-study, see King, 'Chance encounters', and for discussion of the implications of extending this approach in studies of industrialization, see Hudson, 'Challenge of micro-history'. For further examples and a debate about the relationship between micro and macro accounts, see Schlumbohm, ed., *Mikrogeschichte Makrogeschichte*.

[12] The best overview of the British research is found in Schofield, 'British population change', where he considers changes in labour demands, urbanization, and the operation of the poor law as well as 'future earnings prospects' in underpinning demographic change. He indicates that the poor law in particular may have injected some stability into the demographic system in the eighteenth century. Paradoxically, the recent collective analysis of 26 reconstitution studies by the Cambridge Group, while adding much to the macro-framework, does little to elaborate the economic and social experience of individual communities or reconstruct the micro-histories which would allow a perspective on detailed demographic motivations: Wrigley et al., *English population history*. On wage and poor relief factors, see Wrigley and Schofield, *Population history*; Boyer, *Economic history of English poor law*. The most notable British community-level studies are Wrightson and Levine, *Poverty and piety* and the same authors' *Making of industrial society*.

[13] Drake was one of the first historians to emphasize gender differences strongly with respect to marriage behaviour: Drake, *Population and society*. See also Hill, 'Marriage age of women'; Tilly, 'Women's history and family history'; Sundt, *On marriage*; O'Day, *Family and family relationships*; Mackinnon, 'Were women present?'; Gullickson, 'Proto-industrialization'; *idem*, 'Love and power'; Sharpe, 'Literally spinsters'; Gandy, 'Illegitimacy in a handloom weaving community'; Maynes, *Taking the hard road*.

[14] Levine, *Family formation*. This study followed a continental tradition initiated by Mendels, 'Agriculture and peasant industry', *idem*, 'Proto-industrialization', and Kriedte et al., *Industrialization before industrialization*.

[15] Vardi, *Land and the loom*.

Liu, Gullickson, Leboutte, and other researchers suggest a similarly complex relationship between proto-industrial development and existing social relationships with regard to labour, consumption, material support, and demographic experience.[16] Hendrickx's study of the Twente weaving region of the Netherlands shows that neither proto-industry, nor later industrialization, nor deindustrialization, had any profound influence on demographic or socio-sexual behaviour.[17] Schlumbohm's study of linen production in Belm found that the connection between marriage, economic resources, and the formation of new, self-supporting households was not apparent, while Spagnoli's work on Lille also confirms the absence of a link between industrialization and earlier marriage.[18] Lehning's research on proto-industry among the peasants of Marlhes near St Etienne showed no marked shift in the age of marriage: the diversification of the economy was not accompanied by the fracturing of community or of existing patterns of reproduction.[19] Vardi has demonstrated that the increased wealth of linen weavers in the village of Montigny did not cause them to marry earlier or produce more children. They stayed in the village (when they might, in the absence of proto-industry, have been forced to leave) and experienced increased prosperity. It was this stability and improvement in living standards which lay behind population expansion in the Cambresis, largely through reduced mortality.[20] Even for Flanders (the region for which Mendels originally developed his theory of the close links between rural manufacturing prosperity and marriage behaviour) this stability and mortality improvement is now the favoured explanation of the connection between proto-industry and demographic increase.[21]

In England, the analysis of industrializing communities has not proceeded as far. The three proto-industrial areas used by the Cambridge Group (Shepshed, Gedling, and Birstall) appear to have had a remarkable uniformity of trend, if not level, in demographic indicators. All three areas experienced a sustained eighteenth-century fall in marriage ages, buoyant fertility, and a move from the bottom quartile of a ranking of the 26 family reconstitutions in infant, child, and adult mortality terms during the period 1675-1749 to near the top of the rankings by the early

[16] Liu, *Weaver's knot*; Gullickson, *Spinners and weavers; idem*, 'Proto-industrialization'; Leboutte, 'Adaptation, reconversion, mutation'; essays in Medick and Sabean, eds., *Interest and emotion*; Medick, *Weben*; Schlumbohm, *Lebenslaufe*.

[17] Hendrickx, 'From weavers to workers'; *idem*, '*In order not to fall into poverty*'.

[18] Schlumbohm, 'Micro-history and the macro-models'; Mendels, 'Proto-industrialization'; Spagnoli, 'Industrialisation, proletarianisation and marriage'.

[19] Lehning, *Peasants of Marlhes*, p. 43. Mean age of first marriage in 1841-70 was 25.6 for women and 30.56 for men, compared with 25.05 and 29.78 respectively during the following three decades. For an excellent survey of research on France see Lewis, 'Proto-industrialization in France'. He argues that historians of France have been much more willing than those of Britain to adapt the original conceptual approach of proto-industry theory rather than just to use case studies to find it wanting: p. 162.

[20] Vardi, *Land and loom*. For similar arguments see Spagnoli, 'Industrialisation, proletarianisation and marriage'; Lehning, *Peasants of Marlhes*.

[21] Vandenbroeke, 'Proto-industry in Flanders', p. 107; *idem*, 'Regional economy'; Mendels, 'Proto-industrialization'.

nineteenth century. Over the long eighteenth century, the population of these proto-industrial areas grew by 240 per cent, somewhat behind urban districts, but way ahead of small towns and rural areas.[22] There is much in these observations to support a link between the disruptive effect of rural industry and demographic change which would contrast with the recent continental literature. But such a conclusion may be premature. Birstall was a parish of 14 townships whose individual demographic experiences were conflicting rather than complementary.[23] And in other areas of West Yorkshire protoindustry failed to have the impact on demographic behaviour which was initially suggested by historians.[24] In the midlands and elsewhere, a lowering of the age at marriage most often appears to have preceded industrial expansion and was more likely to have resulted from prior agrarian changes than from proto-industry.[25] Both continental and some British studies thus show that localized demographic patterns appear to have had a marked variability and a durability. Industrial development did not merely, or always, disrupt these localized patterns but, on the contrary, often adapted significantly to them.

This article examines the demographic experiences of two Yorkshire textile manufacturing townships, Sowerby and Calverley, in the eighteenth and early nineteenth centuries.[26] It seeks to highlight the ways in which micro-history can deepen our understanding of the character and chronology of change which has been suggested by research at macro-level. The approach taken here is comparative in two respects. First, because the two townships in question, though both experiencing rapid proto-industrial expansion, had different agrarian structures and institutional histories and produced different sorts of cloths for different markets. This involved very different labour demand conditions, different production processes and technological changes, contrasting patterns of organization of trade, and varying fluctuations in prosperity. They also had different patterns of local governance and of poor relief administration. The similarities and the contrasts between these industrial communities enable both general and specific connections between social, cultural, economic, and demographic change to be identified more clearly. Second, the approach is comparative in that it creates the opportunity to compare our family reconstitution results for Yorkshire with those produced for other proto-industrial communities and for rural and urban localities in other parts of Britain and western Europe. This makes it possible to say

[22] Wrigley et al., *English population history*; Wrigley, 'Brake or accelerator?'.

[23] A copy of the reconstitution documentation can be found in the library of the Yorkshire Archaeological Society, Leeds. This suggests that infant mortality in Wyke was substantially greater than in Tong, a feature which would be intensified by the addition of the numerous Moravian infant and child deaths relating to Wyke from the Moravian registers of Calverley.

[24] Hudson and King, 'A sense of place'; King, 'Nature and causes'.

[25] Carpenter, 'Peasants and stockingers'; Wall, 'Real property, marriage and children'.

[26] This is the first stage of broader research considering the links between economic, socio-cultural, and demographic change as well as the integrated nature of these variables and their impact upon everyday life in the townships. For other results see Hudson, 'Landholding and the organisation of textile manufacture'; Hudson and King, 'Rural industrialising townships'; Hudson and King, 'A sense of place'; King, 'Nature and causes'; *idem*, 'Reconstructing lives'; *idem*, 'Migrants on the margin?'; *idem*, 'Dying with style'; Hudson and King, *Industrialization*.

something about the varieties of demographic profile and behaviour which lie behind macro-level indices and about the similarities and differences between communities across Europe, rather than concentrating upon national patterns.

I

The townships of Calverley-cum-Farsley and Sowerby were located within the West Yorkshire textile district which came to dominate much of the English woollen cloth trade by the later eighteenth century (figure 1).[27] From an early date, Sowerby was more than double the size of Calverley in population terms. In the hearth tax of 1664, Sowerby had 312 households while Calverley had 127. By the mid-1750s the population of Calverley had risen to about 1,400, while that of Sowerby in 1764 was 3,004. The 1811 census records Sowerby with 5,177 inhabitants compared to Calverley with 2,390.[28] Late eighteenth-century population growth in both places involved substantial net in-migration as well as sustained natural increase.

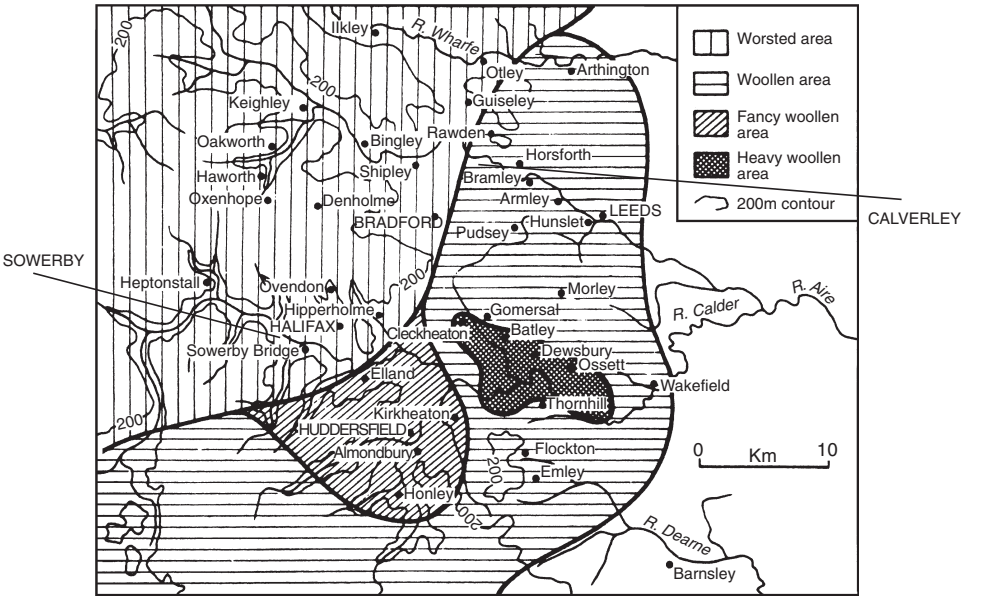


Figure 1. *The location of Sowerby and Calverley within the worsted and woollen areas respectively of West Yorkshire c. 1780–1830*

Although little more than 10 miles apart, the townships had very different forms of proto-industrial organization. Calverley had an early and heavy dependence on the broadcloth industry which apparently did

[27] Heaton, *Yorkshire woollen and worsted*; Hudson, *Genesis*.

[28] Hearth tax: PRO E179/210/393, 16 Charles, Lady Day 1664. Population Book 1764, Sowerby, SPL192, West Yorkshire Archive Service (WYAS), Halifax. Calverley Survey in the parish registers, WYAS, Leeds. 1811 census lists, WYAS, Halifax.

not spring from poor landholding or particularly rapid population growth. It may instead have reflected the active pursuit of economic and social betterment, important with a land market which was almost completely leasehold and tightly controlled. Landholding in the township was polarized, with one family (the Calverleys, succeeded by the Thornhills in 1754) owning most of the land, only a very small middle stratum of landholders, and the bulk of the population who rented small plots or had little direct connection with working the land.[29] Both the Calverley and Thornhill families, but especially the former, were active in attracting farmer-weavers to rent land, in order to maximize their rental income. This was a further encouragement to textile manufacturing in the township.[30] For much of the eighteenth century, over 70 per cent of the male working population were engaged in the textile industry, predominantly as clothiers.[31] Even by the early nineteenth century, when clothworkers were complaining vigorously about the changing character of their trade and the marginalization of independent men, small-scale clothiers making cloth in a family production unit alongside a small landholding (usually rented and of between 9 and 11 acres) were the representative producers in the township. Thus, while large 'putting-out' employers had begun to accelerate 'positive proletarianization', there is evidence that upward social mobility via small businesses and family networks of business remained a possibility until well into the nineteenth century.[32] Household production units generally engaged family labour with one or two journeymen and apprentices, although there was considerable seasonal flexibility and agrarian by-employments were ubiquitous. Before the enclosures of commons and waste land which occurred from the 1750s, additional income and subsistence could be earned from pasturing animals, in particular dairy cows and poultry on the commons. In the second half of the eighteenth century such opportunities declined, releasing low cost female labour for spinning.[33] Technological changes, including the application of water power to scribbling and carding and the slow introduction of mechanized spinning at the end of the eighteenth century, progressively removed some of the major textile work undertaken by women and children in the clothier household. This encouraged the movement of young women into Leeds and a diversification of female economic activity especially into petty production of foodstuffs and drinks for local sale.[34]

By contrast, Sowerby was an upland area where many of the inhabitants in the second half of the eighteenth century, if not earlier, became

[29] For details of the social and landholding structures in the two townships, see Hudson, 'Landholding and the organization of textile manufacture'.

[30] King, 'Nature and causes' p. 68.

[31] The occupational structure of the two townships is discussed in detail in Hudson and King, 'Rural industrialising townships'. Parish register, probate, and other sources are used.

[32] See King, 'Migrants on the margin?'.

[33] The release of cheap female labour after enclosure in West Yorkshire and the boost which this gave to textile competitiveness in the region are explored in Quaide, 'Great wheel and the goose'.

[34] Poor law records testify to the local production of foodstuffs and drinks: see King, 'Reconstructing lives'. Calverley was the second most common place of origin for marriage partners in Leeds who did not claim Leeds itself as their place of residence: King, 'Nature and causes' p. 261.

proletarianized workers in the textile industry. After the 1760s the township predominantly produced worsteds, largely for export markets. This was an industry organized on a 'putting-out' basis by a mixture of urban merchants and local operators. Dependence on the textile sector during the eighteenth century was higher than in Calverley, at around 80 per cent of men in recorded employments. By the 1730s over 50 per cent of male workers are recorded as weavers, a label which had entirely displaced the term clothier by that decade, reflecting a real shift to putting out at the expense of integrated spinning/weaving households and independent producers.[35] However, the description weaver covered a wealth of different household situations. In some cases entire families specialized in just one part of the production process, predominantly weaving. This form increased with the mechanization of spinning at the end of the eighteenth century. In other households family members were involved in tasks at different stages of the production process, often working for different employers and engaged in other seasonal and intermittent work not connected with the textile sector. The landholding of weaving households varied enormously from the landless to those farming 20 acres or more. These variations reflected different mixes of textile specialization and agrarian by-employments from cottager-weavers to those who farmed and leased land and employed neighbours and others as textile workers. Landless weavers were on the increase in the eighteenth century: a product of the positive, if precarious, proletarianization stimulated by the spread of putting out. There was a bigger middling stratum of landholders in Sowerby than in Calverley though the land which they owned was worth much less in agricultural terms. Most middling landholders were weavers and/or textile putting-out merchants (described as yeomen). Unlike in Calverley, farming as an occupation did not figure in Sowerby in the eighteenth century. Although enclosure by act occurred late (in the 1840s), use rights had been considerably reduced long before and the pasturing potential of common lands was in any case limited by the topography and soils of the Pennines. Income earning from spinning textiles had figured centrally in the lives of most women in the township since at least the sixteenth century, but slow mechanization of spinning from the 1780s was beginning to undermine women's waged work opportunities in the home in favour of spinning in larger workshops and proto-factories.

In short, although both townships were dominated by textile manufacture, textile-centred family economies formed a larger proportion of all households in Sowerby than in Calverley. In the latter, textile households still predominated over all others and they were generally more integrated family work units than in Sowerby. However, Calverley had more alternative employments: (for men) in agriculture, building, and metal working and (particularly for women) in the service sector. In both places there was a marked degree of labour flexibility especially in the case of women

[35] The proportion of weavers fluctuated between 51 and 73 per cent of occupied males after 1740 depending on source and time period. See Hudson and King, 'Rural industrialising townships'.

and children and a tendency for their proto-industrial participation rates and roles to contract (in the face of both rapid population growth and technological change) at the end of the period, after half a century of marked expansion.

In both townships, poverty increased at the same time as industry flourished. Poor law data for Calverley suggest that expenditure started to rise soon after enclosure in 1755 and peaked at the turn of the nineteenth century, a function both of inflation and of the increase in numbers on relief.[36] This said, the level of relief offered was meagre, particularly to the elderly and infirm. Average pensions of less than 2s. per week were one-third or half lower than the average level of pensions offered by many southern counties.[37] Moreover, such pensions were offered to relatively few people, a reflection of the fact that relatives were, and were expected to be, active in the provision of welfare.[38] Fragmentary returns for the mid-eighteenth century indicate that poor relief spending in Sowerby also increased consistently as the worsted industry consolidated its presence, and somewhat faster than population growth in the township.[39] By the time poor relief returns were being made to Parliament, after 1802-3, Sowerby was spending 2s. 3d. per pauper, 16 per cent above the figure for Calverley.[40] These broad differences persisted well into the third decade of the nineteenth century, when they diverged further in the run-up to the new poor law.[41] Differences also emerge when we look at other aspects of welfare. Middling groups in Sowerby appear to have responded favourably to parish-level initiatives on charitable donations to relieve suffering arising out of trade crises, while the Calverley middle class appear to have been both less prominent and much less responsive collectively to poverty.[42] The level of activity in placing hundreds of pauper children in apprenticeships in Sowerby during the eighteenth century has no counterpart in Calverley where boarding was more common.[43]

It is difficult to discern how far the differences in welfare structures

[36] King, 'Reconstructing lives', p. 324.

[37] There were some exceptions but it appears that the poor law regimes of the south and east were relatively generous compared with those of the north and west: Smith, 'Ageing and well being'.

[38] It is notable that those without relatives (through blood or marriage) tended to come to the poor law earliest in the life-cycle and remained on communal relief the longest. Relatives are here defined and identified using the standard methodology employed by Wrightson in 'Kinship in an English village'. This excludes the refinements suggested by Reay, 'Kinship and the neighbourhood' or Cooper and Donald, 'Households and hidden kin'.

[39] SPL series, WYAS, Halifax; 'Marshall papers', WYAS, Leeds. For a review of earlier documentation on the poor law which now appears to have been lost, see Gott, *History and antiquities of Halifax*.

[40] This widens when allowance is made for differential administrative costs. For a discussion of filtering procedures used to separate administration from other items in poor law accounts, see Hopkin, 'Poor law strategies in Yorkshire'.

[41] For these figures, see Rose, 'New poor law in the West Riding'. See also Hopkin, 'Poor law strategies in Yorkshire'.

[42] Smail, *Origins of middle class culture*; King, 'Reconstructing lives'; dole book for Halifax parish, SPL 164, WYAS, Halifax.

[43] Despite a well preserved set of poor relief accounts for Calverley, only a handful of pauper apprenticeship indentures have been discovered whereas there are over 500 for Sowerby for the eighteenth century: SPL, 108, WYAS.

between the two places reflected differences in wealth distribution, the scale and intensity of poverty, differences in the ease with which the poor could be absorbed within the household economies of their relatives, or differences in philosophy on the part of those administering relief.[44] Population appears to have grown more consistently in Sowerby than in Calverley during much of the eighteenth century, reflected in the relative movement of vital event totals shown in figure 2. In both townships proto-industry was accompanied by growing wage dependency and periodic economic insecurity, associated with trade fluctuations. Artisans in Calverley maintained small plots of land which could help to cushion them from the worst excesses of market instability but there is no doubt that the numbers of individuals and families existing on the margins of economic viability were increasing in both places. This was reflected both in the poor relief figures and in rising mortality rates.

In order to explore the dynamics of population change, in these very different proto-industrial townships, they have been subject to family reconstitution.[45] This process yielded 1,664 family histories and 6,000 partial or full individual life histories for the township of Calverley, and 3,950 family histories and 11,000 partial or full individual life histories for Sowerby. From these we are able to calculate aggregate demographic variables, for both communities, comparable with other studies and to explore the demographic experience of sub-groups and individuals within a wider quantitative framework. To this end we have linked family and group life histories to a range of economic, social, and institutional information derived from sources including poor law material, and tax returns, wills and inventories, depositions, leases, business records, newspapers, and the early nineteenth-century census returns. Thus demographic behaviour can be related much more closely to its economic, social, and cultural context than is usually the case.

The key problem with reconstitution studies is that they focus upon the experience of the least mobile sections of the population. Debate on the representativeness of this group in terms of demographic (and other) characteristics has been fierce and has spawned a number of technical procedures for making allowances for the fact that it is rarely known at which date a person moves from observation.[46] Ultimately, the impact

[44] Factors determining levels of poor relief and poor relief policy in Calverley are the subject of King, 'Reconstructing lives', and patterns of relief in both townships are further explored in Hudson and King, *Industrialization*.

[45] We are alert to the persistent doubts about the technique of family reconstitution and the subset of the population whose demography it identifies (see, e.g., Razzell, 'Growth of population'; *idem*, 'Conundrum'; Ruggles, 'Migration, marriage and mortality'; *idem*, 'Limitations of English family reconstitution'). The comparative approach is probably one of the most illuminating ways of using reconstitution results because conclusions are not based solely on the absolute accuracy of specific applications: comparisons are useful in themselves as long as a standard methodology prevails. The demographic estimates presented in this article were calculated using standard sources and methods of family reconstitution. Elsewhere we have reported on the process of 'enriched reconstitution' which allows a more sensitive analysis of demographic behaviour: King, 'Historical demography'.

[46] See principally, Ruggles, 'Migration, marriage and mortality', although Wrigley has provided a powerful rebuttal of this critique: 'Effect of migration on estimation'.

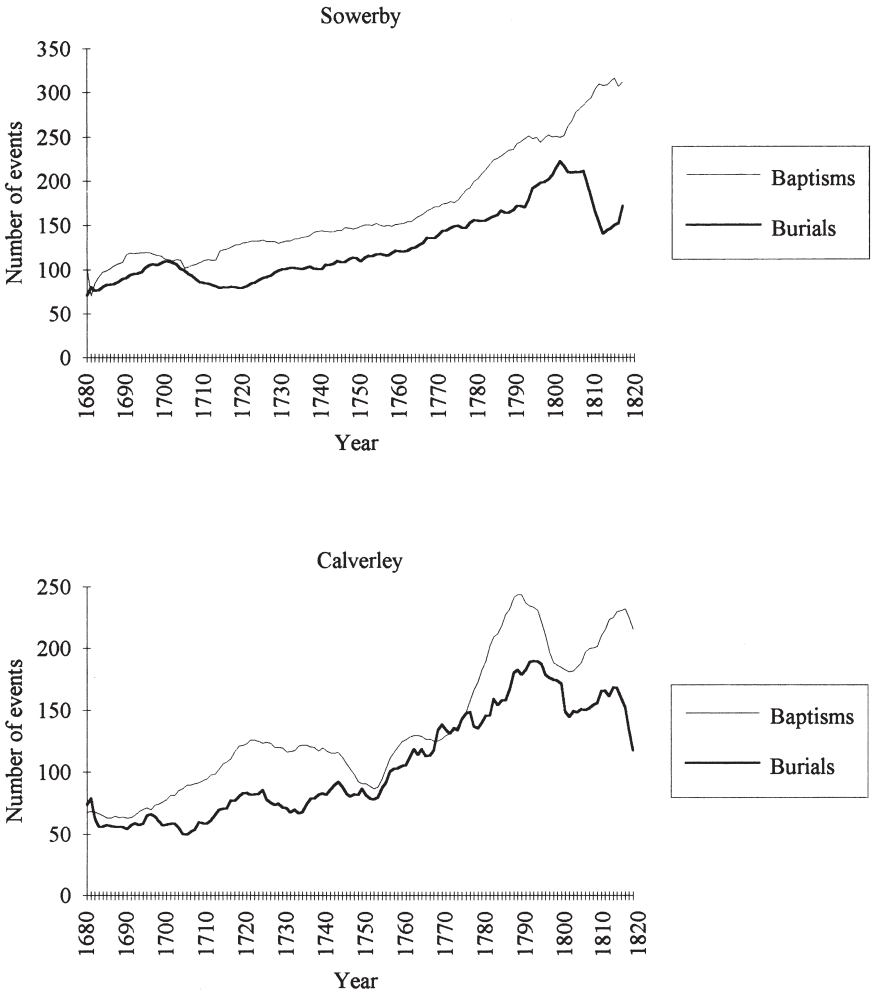


Figure 2. *Baptisms and burials (nine-year moving averages) from Church of England and nonconformist registers for Sowerby and Calverley, 1680–1820*
Source: Sowerby and Calverley Church of England parish registers and microfilm of Sowerby Independent and Methodist Register, West Yorkshire Archive Service, Leeds and Halifax. Calverley Moravian registers microfilm, Yorkshire Archaeological Society. Calverley Independent and Baptist registers, PRO. A small number of vital events for Sowerby and Calverley are also included from the parish registers of neighbouring churches and chapels and from overlapping nonconformist circuits.

of migration upon demographic measures such as infant mortality or age at first marriage and, more especially, on measures of concentration (employed below) is unknowable. However, in common with most proto-industrial communities, both Calverley and Sowerby saw a decline of out-migration as the intensity of industry increased, enabling the reconstitution to capture a growing proportion of the total population. The percentage of marriage partners for whom both baptism and burial records exist in Calverley rises from 27 per cent to 44 per cent comparing 1700-49 with 1750-99. The comparative figures for Sowerby are 22 per cent

and 39 per cent, indicating a significant increase in 'stayers' in both townships by the second half of the eighteenth century.[47] Furthermore, as Wrigley has suggested, those who left were often not unrepresentative of those who stayed.[48] It is possible to trace a proportion of those who left Calverley for Leeds in the marriage registers of the town. This suggests that out-migrants had very similar marriage age profiles (in terms of mean and standard deviations) to those who stayed.[49]

Nonconformity is also an issue because Anglican registers may capture a biased sample in terms of demographic behaviour. In our study, the databases underpinning the reconstitution samples contain the surviving nonconformist registers (which include the largest groups of nonconformists in the area: Independents, Baptists, and Moravians). Including the nonconformist populations in the reconstitution makes a negligible difference to the profile or behaviour of vital variables. These groups constitute only a small percentage of the life events encompassed by family reconstitution. Even in late eighteenth-century Calverley, which fell under the influence of the sizable Moravian community at Fulneck, nonconformist events make up only 9 per cent of all births recorded in family life histories.

Section II exposes our findings in comparative context and Section III begins to explain them. What follows has important implications for future demographic analysis at local and national levels because of the emphasis which we place upon the impact of subgroup behaviour within broader, more stable, demographic regimes.

II

Important differences in the demographic framework of the two townships, and between the townships and a sample of other reconstitutions, are revealed in figures 3-9 and table 1. Mean female age at first marriage, emphasized as the key driver of English demography at national level after 1750, appears to have only limited relevance to the demographic systems of Calverley and Sowerby in the long eighteenth century. Mean female first marriage ages in Calverley were consistently low and stable over the long eighteenth century. The number of cases is too small to offer definitive explanations, but stability of mean marriage ages in the face of proto-industrial development seems to have been relatively common on the continent.[50] The Calverley study thus poses important questions for proto-industrial and demographic historians of England. Sowerby is more consistent in following the 'proto-industrial pattern' of some decline in female marriage ages suggested by Wrigley et al., but even

[47] King, 'Migrants on the margin?', p. 288, which gives more details of residential stability for Calverley; reconstitution results for Sowerby.

[48] Wrigley, 'Effect of migration on estimation'.

[49] Reconstitution results.

[50] See, e.g., Hendrickx, *In order not to fall*; Trompetter, *Agriculture, proto-industry and Mennonite entrepreneurship*; Gutman and Leboutte, 'Rethinking proto-industrialization'; Cerman and Ogilvie, *European proto-industrialization*; nn. 18-21 above.

Table 1. *The distribution of female first marriage ages in Calverley and Sowerby*

Calverley						*Sowerby*				
3rd quartile	*9th decile*	*Mean*	*1st decile*	*1st quartile*	*Years*	*1st quartile*	*1st decile*	*Mean*	*9th decile*	*3rd quartile*
25	28.6	23.2	18.5	20.2	1680-99	20.7	19.1	24.6	31.8	27.5
25.2	28.9	23.6	18.9	20.1	1700-24	20.8	19.1	24.3	31.4	27.1
25	28.5	23	18.2	20	1725-49	20.4	18.6	23.8	30.4	26.2
25.1	28.2	23.2	18.3	20.4	1750-74	20	18.2	23.6	29.6	25.3
25	28	22.9	18	20	1775-99	19.7	17.9	23.4	29	25.1
24.7	27.7	22.8	17.8	19.7	1800-24	19.5	17.6	23.1	28.1	24.9

Note: Sample sizes: Calverley 650, Sowerby 1365. Distributed as follows in chronological order by sub-period: Calverley: 40, 65, 90, 137, 156, 162; Sowerby: 65, 140, 200, 270, 332, 358.
Source: Family reconstitutions. For comparable data see Wrigley et al., *English population history*, pp. 146-7

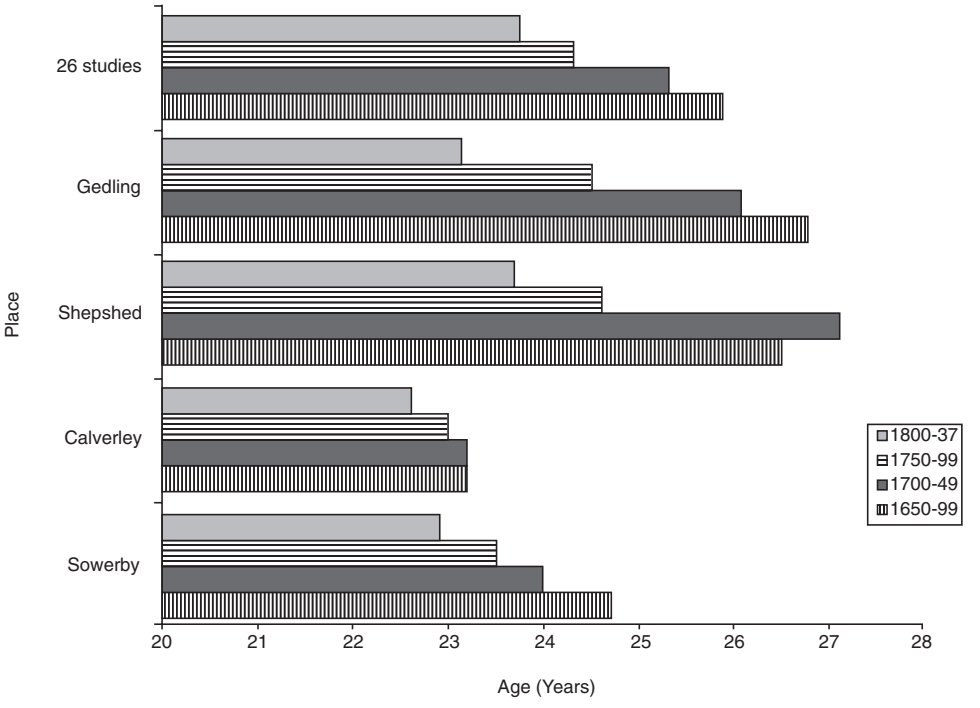


Figure 3. *Mean female first marriage ages in comparative perspective*
Note: sample sizes: Calverley 762, Sowerby 1,650
Source: Family reconstitutions, and Wrigley et al., *English population history*, pp. 184–5

here the fall was only of the order of 18 months over the period 1680-1820.[51] As figure 3 suggests, the fall in female marriage ages in most other studies, including those of other proto-industrial areas such as Gedling and Shepshed, was significantly more pronounced although the base from which the decline started in Sowerby was lower.[52] This observation is surprising given the rapid rise of the putting out system,

[51] For a model of the significance of falls in the age at marriage to measures such as the gross reproduction rate, see Wrigley et al., *English population history*. Even on a conservative estimate, up to one half of this variation might be explained by biases in all reconstitution data along the lines suggested by Ruggles, 'Migration, marriage and mortality', although Wrigley has provided a powerful rebuttal of this critique: 'Effect of migration on estimation'.

[52] Low marriage ages characterize the small-scale reconstitution of the village of Countesthorpe, near Shepshed: Carpenter, 'Peasants and stockingers'. Continental studies have variously emphasized the degree of dependency upon money wages and the nature of the sexual division of labour as the key variables determining whether proto-industrial areas would experience falling female ages of first marriage. See Spagnoli, 'Industrialisation, proletarianisation and marriage'; Gullickson, 'Proto-industrialization'. One could also argue, of course, that the relationship between proto-industry and demographic change is dependent upon threshold levels of proto-industrial dependency: that the major decline in both Sowerby and Calverley may have occurred earlier than 1660, perhaps in the sixteenth century when textile manufacturing first began to engage a significant proportion of the population. We have tested this for Calverley by taking the family reconstitution back to the early seventeenth century on a selective basis. No decline in marriage ages is discernible for the seventeenth century. Marriage licence evidence supports this, despite the fact that in the early seventeenth century less than 30% of male occupations were associated with textiles in the township compared with over 70% a century later.

agrarian change, and the speed of proletarianization in Sowerby in the eighteenth century.[53]

Aggregate indicators are significant but it is the dispersal of the marriage ages, rather than their mean, which may well hold the key to characterizing and explaining nuptiality. As Goldstone saw, and as Wrigley et al. confirm, a central feature in the falling age at marriage nationally was the replacement of a core of late-marrying women with a core of early-marrying women, accompanied by a narrowing of the variability of female marriage ages.[54] Sowerby would appear to line up with such national trends and to match the experience of other proto-industrial communities in this respect. The standard deviation of female marriage ages fell over time, to around the mean standard deviation of all 26 Cambridge reconstitutions, and duplicates that calculated for Shepshed.[55] Identifying the behaviour of quartiles and percentiles in marriage ages for Sowerby illustrates that shifts in the mean were largely a result of changing behaviour at either end of the spectrum (table 1). Calverley, by contrast, with a stable standard deviation of 3.0, and an interquartile range of 7, as well as relative stability of the mean throughout the period, really stands out.[56] Male marriage ages are generally accepted to be less important to the dynamics of local demographic systems but it is instructive to note that male age at first marriage was relatively stable over the long eighteenth century in both townships although it seems to have been more concentrated in the age spectrum in Sowerby than in Calverley (figure 4).[57] This contrasts with the Cambridge Group sample where male marriage ages fell overall by around 3 years with proto-industrial Gedling and Shepshed experiencing a more pronounced fall.

These observations about nuptiality complement the marked variations of local experience found in the 26 Cambridge reconstitutions and add weight to a continental literature which calls for a reinterpretation of the demographic

[53] The limited decline in mean female marriage age and the low base place the township at the extreme end of the Cambridge Group's 'proto-industrial' typology or even outside it.

[54] Goldstone, 'Demographic revolution'. This phenomenon may have been particularly marked in handicraft communities. At the turn of the nineteenth century the gap between the highest and lowest mean female marriage ages in the reconstitution sample was four years. This was more than the fall in aggregate marriage ages over the course of the long eighteenth century: Wrigley et al., *English population history*.

[55] Levine, *Family formation* p. 161. See also Wrigley et al., *English population history*.

[56] The number of cases for this township is relatively small and generates all of the potential problems of manipulating data based upon a sub-sample of the population. Yet extensive testing of these findings, and the linkage on which they are based, suggests that this picture of low, stable, and concentrated marriage ages is more than simply a product of random variation or incorrect linkage. See King, 'Nature and causes'.

[57] In short, women in the artisan township of Calverley (where proletarianization occurred later and more slowly) generally married within a restricted age band around the early twenties, while their husbands showed rather more variation in marriage ages. In Sowerby, it was the grooms who had the most concentrated marriage age experience, which might suggest that a 'normal' age at marriage for men was accompanied by a need to find a wife even if she was considerably older or younger than the man concerned. A continuing tendency for Sowerby grooms to draw their brides from within the township or somewhere in close proximity may have intensified this experience. For more on marriage horizons, see Hudson and King, 'Rural industrialising townships'.

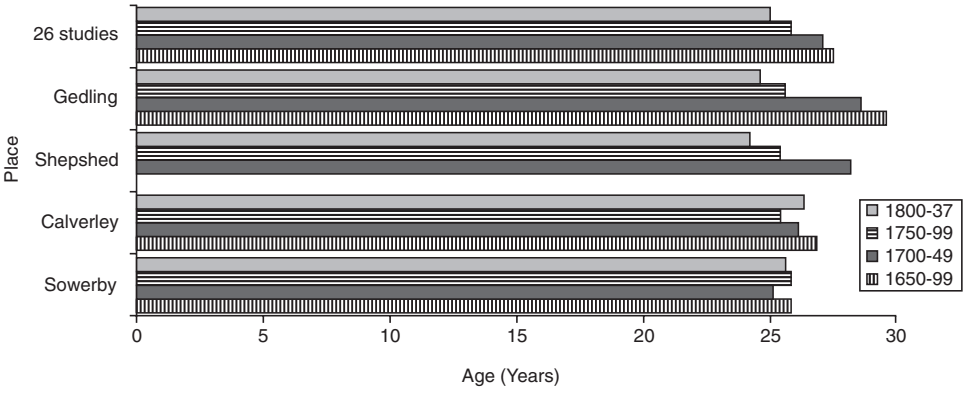


Figure 4. *Male ages at first marriage in comparative perspective*
Note: sample sizes: Calverley 784, Sowerby 1,635
Source: Family reconstitutions, and Wrigley et al., *English population history*, pp. 184–5

implications of proto-industrialization.[58] The general, rapid, and pronounced falls in marriage ages suggested by Wrigley and Schofield and highlighted by Levine, Mendels, and others in proto-industrial areas, have little place in these two textile townships. However, as figure 5 suggests, the picture is not yet complete. Celibacy in Sowerby more than halved between the late seventeenth century and the early nineteenth, with the fall most pronounced in the later eighteenth century.[59] This contrasts with the wider sample of 26 reconstitutions which experienced a more limited decline on trend in the

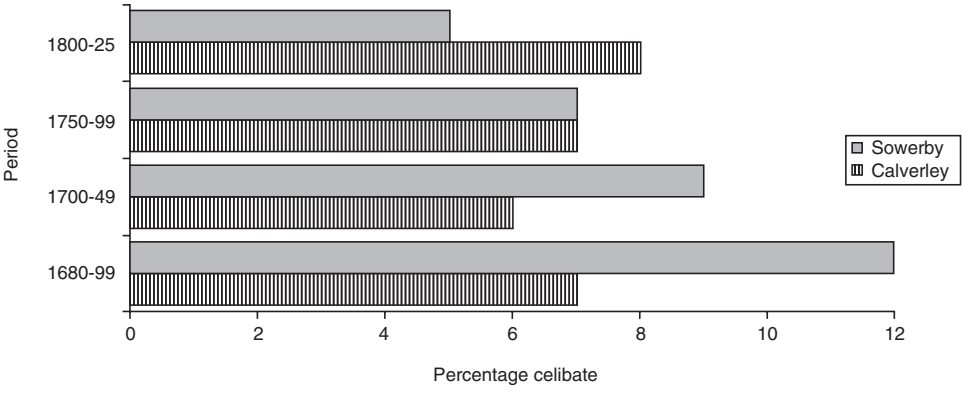


Figure 5. *Female celibacy rates in Calverley and Sowerby*
Source: Family reconstitutions. For method of calculation see text.

[58] See, most recently, Hendrickx, '*In order not to fall*'; Trompetter, *Agriculture, proto-industry and Mennonite entrepreneurship*.

[59] Methods used to calculate female celibacy rates from reconstitution data involve identifying women who reach the age of 45 without ever being married. The figures are at best 'fuzzy' and provide only an approximation. Male celibacy rates cannot be calculated. This is unfortunate given the concentrated male marriage age range in Sowerby which might suggest that for men the 'rather never than late' maxim has considerable pertinence after 1750. For this maxim, particularly in relation to spinsters pre-1700, see Weir, 'Rather never'.

female celibacy rate. The experience of Calverley could not be more different, suggesting that not only were marriage ages low, but for much of the early part of the long eighteenth century, celibacy rates were low as well. By the early nineteenth century, the township represents the high side of recorded female celibacy rates in proto-industrial areas (where rates had fallen) but was still below the 'national' mean. Overall, changing nuptiality in Calverley cannot have been responsible for the population growth in the township. In Sowerby, by contrast, a gentle (though not equitably distributed) fall in female age at first marriage combined with an increasing rate of marriage (especially after 1750) to contribute to the upward drift of population. Such results begin to highlight the importance of micro-studies in exposing different paths and patterns of demographic development between proto-industrial communities.

Fertility trends provide further evidence of variation. The certainty of 1981 that marital fertility levels were roughly stable and uniform across English time and space has been replaced with a realization that total marital fertility rose during the long eighteenth century.[60] The proto-industrial communities in the Cambridge sample all experienced an upturn in marital fertility after the middle of the eighteenth century. The same was not true for rural areas or market towns. Figure 6 presents birth interval data as an indicator of fertility changes in our townships in comparative perspective. For both places, birth intervals suggest that marital fertility was high and rising compared with other proto-industrial and rural communities. In Calverley marital fertility rose particularly strongly and it, rather than nuptiality, appears to have been the stimulus to natural population growth. Our township studies support the conclusion that industrial areas stood at the heart of marital fertility rises in the later eighteenth century with one important proviso. The key feature of aggregate fertility change was an increase in the proportion of birth intervals of 12-18 months and a fall in the proportion of 36 months or more, as indicated in figure 7. This resulted from growth in size of a subset of women who had consistently short birth intervals (around 15 per cent of those for whom we have complete fertility life cycles in the two townships) and a further shortening of their birth spacing in the middle of the child-bearing years. It did not result from a generalized reduction of birth intervals for the majority. This might, of course, reflect a reduced tendency for certain families to have incomplete local church baptisms but it is notable that a similar concentration of high fertility experience is to be observed among the Moravians of Calverley for whom registration appears to have been rigorous.

In the national figures and in Sowerby (figure 8), illegitimate fertility complements this picture. Sowerby saw bastardy levels rise considerably such that by the early nineteenth century over 8 per cent of all births in the township were illegitimate. This was generally in line with the experience of other proto-industrial communities, but ahead of the experience in rural areas. As with other demographic indicators, illegitimacy was

[60] Wilson, 'Natural fertility'; Wrigley et al., *English population history*.

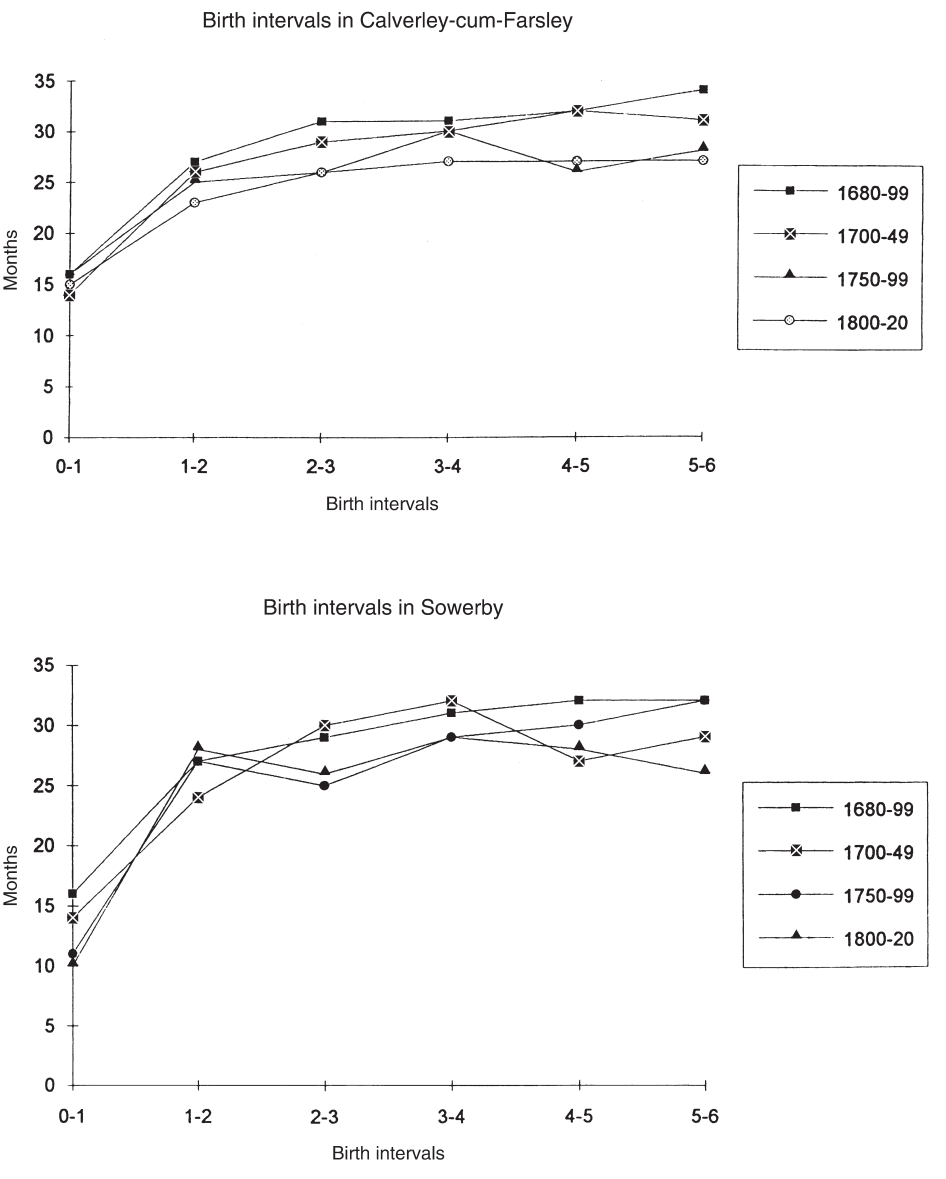


Figure 6. *Birth intervals in Calverley and Sowerby in comparative perspective*

(Figure continues overleaf)

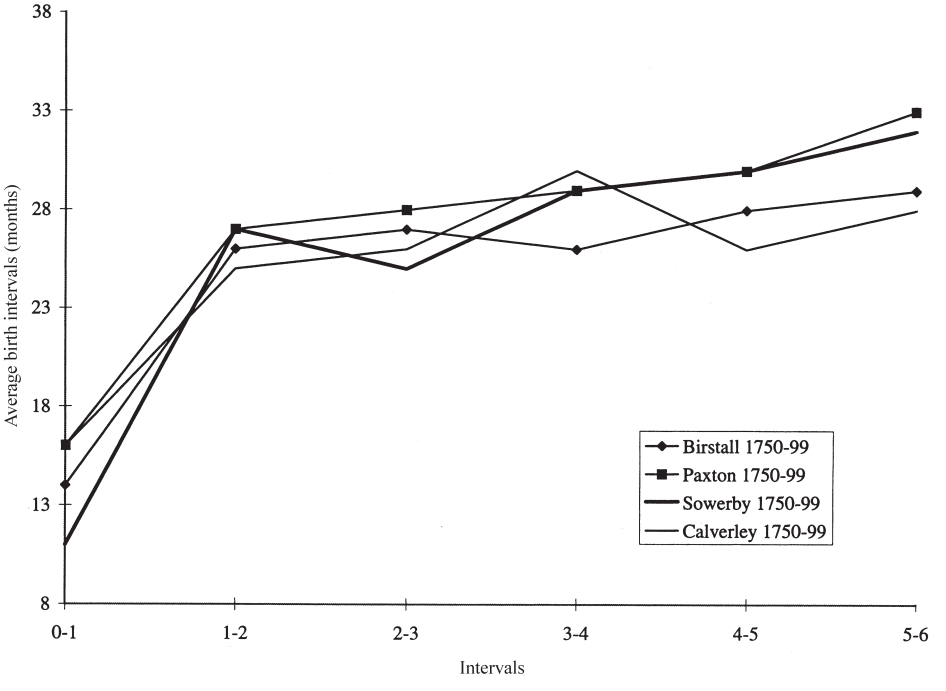
Note: sample sizes: Calverley 2,736, Sowerby 5,377

Source: Family reconstitutions. For comparative material see Yorkshire Archaeological Society, 'Family Reconstitution Collection', and Don, 'Reconstitution of Paxton'.

associated with a finite subset of the population (about 8 per cent of the potential pool of bastard-bearing women between the ages of 18 and 29 for any 20-year cohort) and with repeated illegitimacy experience within this group.[61] Infant mortality among illegitimates was high in Sowerby in common with the findings of other studies.[62] Because of this the

[61] This concentration of illegitimacy within a finite subset has been identified for some time. See, for example, Laslett et al., *Bastardy*.

[62] Crudely estimated, this averaged 394 per 1,000 compared with 120 per 1,000 of legitimate infants. See also Wrigley et al., *English population history*, pp. 219-22.



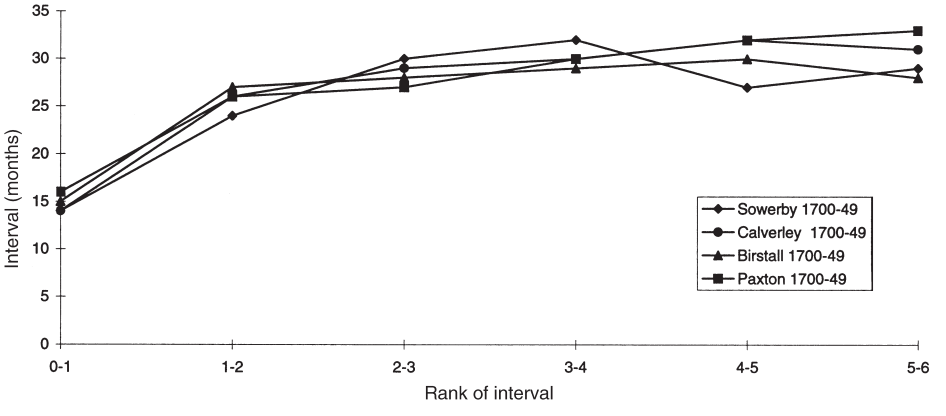


Figure 6. *continued.*

impact of illegitimacy itself upon population growth rates was limited. But the pre-nuptial pregnancy (PNP) rate (42 per cent of all first births by 1810) which grew alongside illegitimacy in Sowerby was significant enough to impact upon total fertility (which rose by over one-fifth between the early and late eighteenth century) and upon population growth rates. These experiences make the history of illegitimacy in Calverley very intriguing. In contrast to most other studies, illegitimacy fell over the course of the eighteenth and early nineteenth centuries and never reached

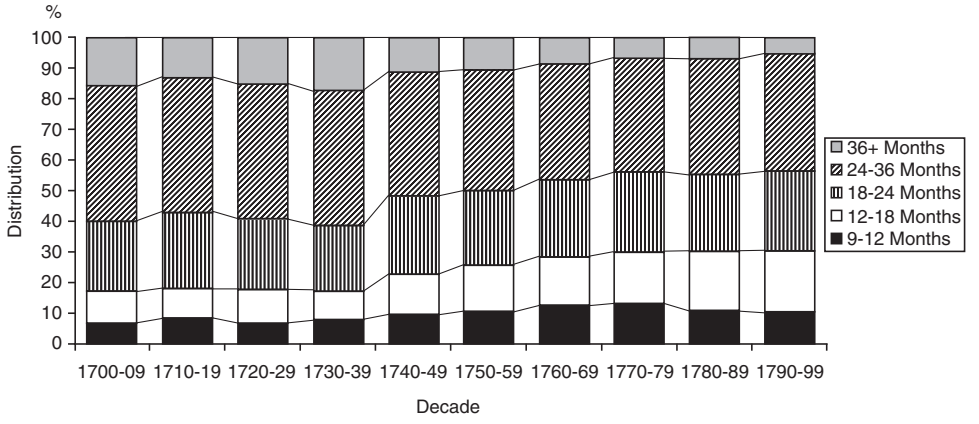


Figure 7. *Distribution of birth intervals for births 1–8 (Calverley and Sowerby combined)*
Note: sample size: 8,571
Source: Family reconstitutions

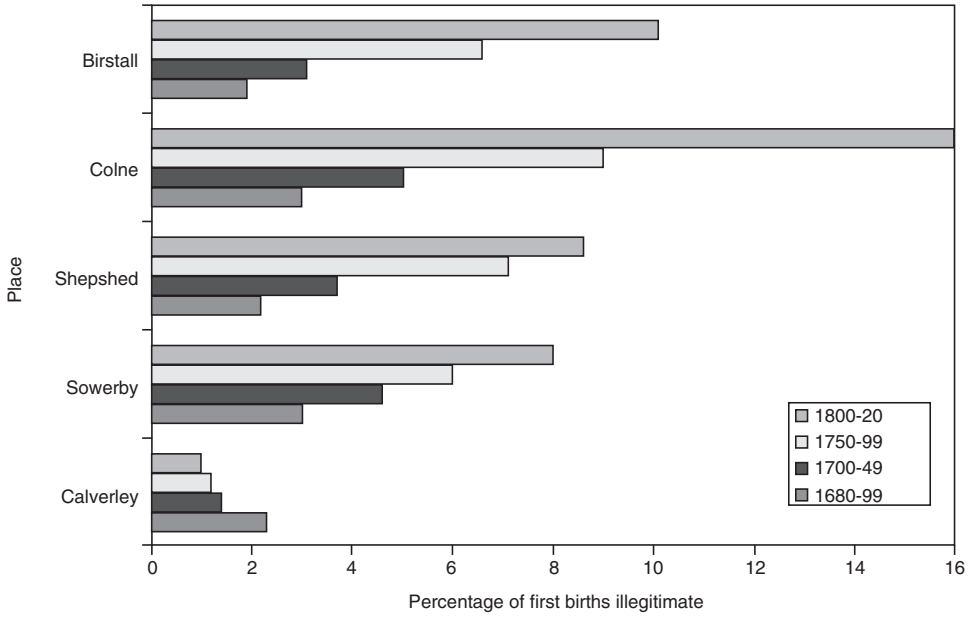


Figure 8. *Calverley and Sowerby illegitimacy in comparative perspective*
Source: Family reconstitutions. For comparative material see King, 'Nature and causes'

more than 2 per cent of all births after 1700.[63] As in Sowerby, the vast majority of illegitimate births were confined to a small subgroup while PNP was much more widely dispersed. PNP rates in Calverley rose from less than 10 per cent to 36 per cent of all births by the early nineteenth

[63] There is little evidence to suggest that this is a reflection of inadequate recording of illegitimate children, especially since at various points in this period the registers provide an extraordinary level of detail on the registration process. Informal marriage could, of course, upset this picture since it

century.[64] This evidence of the limited distribution of illegitimacy experience, especially in Calverley, and the much more widespread incidence of PNP, is difficult to reconcile with the commonly stated thesis that illegitimacy in the eighteenth century was largely precipitated by the breakdown of post-conception marriage plans because of economic crises and resultant out-migration.[65] Illegitimacy experience appears to have been too concentrated to be a result of generally experienced economic factors alone.

The other significant pillar of the demographic systems in our proto-industrial townships was mortality. Mortality levels, trends, and spatial variations were dominated, as elsewhere, by the dynamics of infant mortality.[66] Once again the townships had contrasting experiences, as figure 9 suggests. Infant mortality *levels* in Calverley were above the average for rural areas in the 'national' sample, but well below the mean of all 26 family reconstitutions. And while the township was roughly on a par with the proto-industrial village of Gedling, it lagged well behind infant death rates in Sowerby. Here, infant mortality rose very significantly in the later eighteenth and early nineteenth centuries, reaching almost 200 per thousand. Of the 26 Cambridge Group reconstitutions, only Birstall and Banbury approach these levels at this time. The significant point about both townships, however, lies less in the level of infant mortality than in the *trend*. Birstall, Gedling, Shepshed, Calverley, and Sowerby experienced more or less consistent upward movements in infant mortality during the rural industrialization process. This contrasts with the rise in 1700-49 and consistent falls thereafter which can be seen in the 'national' sample. The conclusion that proto-industrial areas 'bucked' the national mortality trend is reinforced by the results of our research.[67] This finding contrasts with some of the continental literatures which have stressed the positive relationship between rural industry, improving incomes, health, and longevity, albeit in the nineteenth rather than the eighteenth century.[68] But, as is shown below, mortality experience had

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is uncertain how births to parents in this sort of union would have been viewed. We cannot estimate this directly, but in Calverley there was a slight increase during the eighteenth century in the number of people for whom their own baptisms and the baptisms of their children, but no marriage, could be traced. This may have reflected consensual unions given that all surrounding parish registers were searched for this part of the study. In Sowerby there was a rather stronger increase in the number of life-cycles of this sort. In common with other studies, we can simply note this phenomenon rather than control for it. Gillis, *World of their own making*; Lemmings, 'Marriage and the law'.

[64] King, 'Nature and causes'.

[65] Levine, 'Industrialization and the proletarian family', p. 185; Tilly and Scott, 'Women's work and family economy'.

[66] Adult mortality levels are in any case very difficult to calculate with family reconstitution data and involve the implementation of a number of assumptions about the timing of migration on the part of those at risk. These issues are explored in King, 'Profitable pursuits?' and idem, 'Historical demography'. See also Ruggles, 'Migration, marriage and mortality'.

[67] Relatively high infant mortality in our townships, and more generally in proto-industrial areas, also carried over into relatively heavy mortality in early childhood. This is reported in King, 'Profitable pursuits?'.

[68] Vardi, *Land and loom*; Vandenbroeke, 'Proto-industry in Flanders'. On one level our mortality rate findings endorse Wrigley and Schofield's emphasis upon marriage and fertility as the engines of population growth in the eighteenth century. There is, however, a contrary implication: if such high proto-industrial mortality rates were repeated throughout most proto-industrial areas, life

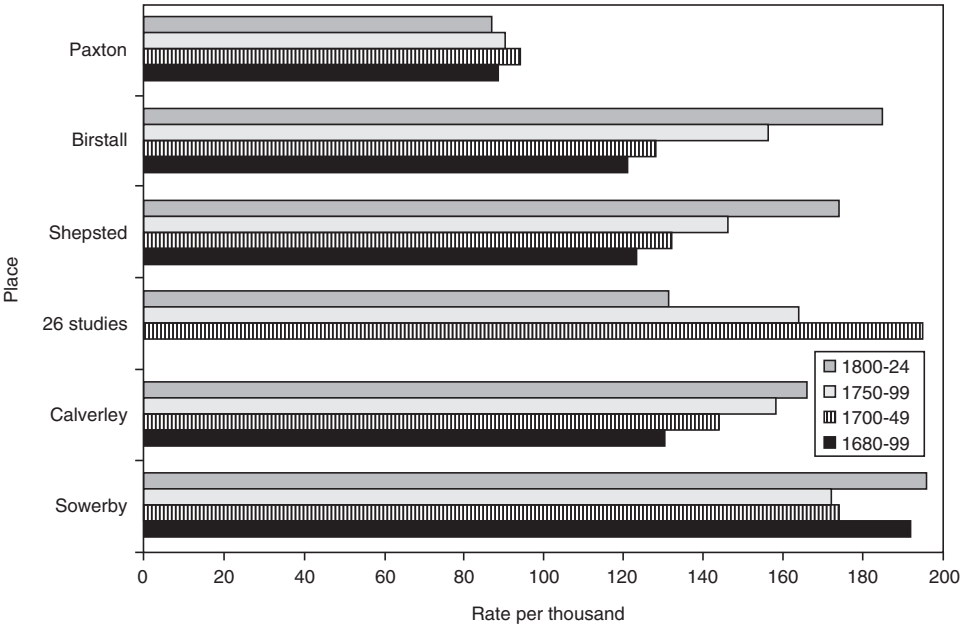

Figure 9. *Calverley and Sowerby infant mortality in comparative perspective*
Note: sample sizes: Calverley 649, Sowerby 1,491
Source: Family reconstitutions. For comparative material see Yorkshire Archaeological Society, 'Family Reconstitution Collection'; Wrigley et al., *English population history*; Don, 'Reconstitution of Paxton'

much to do with kinship support networks, very localized environmental conditions, variable access to food supplies, domestic arrangements, and weaning habits. These factors, affecting restricted groups in the population, appear to have been much more important than the nature of the dominant economic sector alone in accounting for changes in mortality.[69]

Death rates in both Sowerby and Calverley increased over time, but not because there was a significant increase in risk for the majority of the population; in fact mortality experiences for most families were stable or improving. What caused the identifiable increase in average mortality levels was an increase in the number of families susceptible to multiple infant deaths and an increased mortality incidence among susceptible families. Thus in Calverley between 1680 and 1820, 330 families lost 649 infants but 319 (50 per cent) were in just 102 families with four families experiencing six or more infant deaths. Background mortality was thus of the order of 60-80 per thousand by 1800 while foreground

expectancy must have been improving very markedly indeed in areas elsewhere in order to bring the national averages up sufficiently to indicate mild improvement. With rural to urban and agricultural to proto-industrial migration, an increasing proportion of the national population over the course of the eighteenth century were exposed to high and often deteriorating mortality regimes which suggests that national averages might be disguising substantial levels of improvement in some regions. Renewed research on regions, localities, or population subsets experiencing improving life expectancy during industrialization is long overdue. See Razzell, 'Growth of population'

[69] Hudson and King, *Industrialization*.

mortality among the small number of high mortality families was as high as 240.[70] In Sowerby the figures are even more stark. Eight hundred and sixty-nine families lost 1,491 infants but 150 families lost at least three infants and 40 families lost six or more. As in Calverley, the numbers of these high mortality families grew in the later eighteenth century over and above the number which would have been expected simply because of rising population. That this is not simply a matter of better detection of deaths can be demonstrated by using the Moravian families of Fulneck (in Calverley) as a control: there is a near exact measure of mortality concentration in flawless registration data. The susceptibility of families in both Sowerby and Calverley appears to have been largely unrelated to family size: in the former, 8 per cent of all infant deaths were among families with nine or more births but these families accounted for 17 per cent of all allowable births during the eighteenth century. Similar observations are found in Calverley: even within family size groupings the concentration is clear: between 1750 and 1820, 50 per cent of all infant mortality in completed families of 10+ children was concentrated in just 9 per cent of all families of this size. For families with a completed size of six children, 50 per cent of all deaths were concentrated in just 11 per cent of all families. Many families with eight and more children lost none at all. For example, John Hainsworth, a Calverley clothier, and his wife Hannah had nine children between 1804 and 1816 and lost only one child (aged 8 months), in 1811. In Sowerby the background rate for the last quarter of the eighteenth century was 105:1000 while the foreground rate was 310, demonstrating that Sowerby experienced higher infant mortality than Calverley across the range. The concentration of high mortality in certain families is not a novel observation: it has been found in Swedish and other continental data.[71] Nor is it a feature which emerged in our townships only in the eighteenth century: it simply appears to have become more intense at that time. The finding is significant because of the implications it has for analysing the causes and consequences of infant death.

Thus all of the major demographic variables—illegitimacy, mortality and to a lesser extent but still to a pronounced degree, fertility and nuptiality—shifted at the aggregate level in our townships in the eighteenth century because of proximate change in the number of families who were experiencing extremes of behaviour and because there was an increasing intensity of extreme experience. Such families had always been present but, especially in the late eighteenth century, their experience came disproportionately to shape aggregate patterns. This raises important

[70] Isolating background and foreground mortality rates in these terms brings the acute problem of statistical significance with small sample size. Thus, calculating a rate for background mortality among those families in Calverley which experience few if any deaths in the period 1775-1800 would involve just 19 deaths. The tendency of demographers to concentrate on rates is ill suited to this sort of analysis. Reviewing the plain numbers is sufficient indication of concentrated experience to warrant closer investigation.

[71] Knodel, *Demographic behaviour*; Brandstrom and Sundin, 'Infant mortality'. For more on Calverley see King, 'Dying with style'.

questions about the prevalence and impact of subgroup experiences more generally, especially during the period of industrialization.

III

Changes in aggregate indicators appear to have resulted from fundamental changes in the behaviour of finite, relatively small, subsets of the population while the demographic activity of the majority remained roughly stable and apparently undisturbed by economic transformations. If changing social, economic, and institutional forces were the most important causal factors in population change, they appear to have been felt most keenly by a small proportion of the township populations and/or by individual birth and marriage cohorts. This paints a rather different gloss on the whole issue of demographic motivation from that provided by macro-theories of change or by theories which try to explain behaviour and motivation in relation to particular typologies of communities such as 'the proto-industrial.'[72]

Before proceeding to offer some initial analysis of the observed concentrations of demographic experience, it is necessary to comment upon the statistical significance of the level of clustering which we have found and upon the extent to which different subgroups overlapped. It is difficult to compare the degree of concentration of extreme demographic behaviour in Sowerby and Calverley with other studies as these are few and no reliable benchmark measures exist for 'normal' clustering. It is possible, however, to get some clue by comparing infant mortality concentrations for our townships with those found by Brandstrom for the Swedish town of Jokkomok, which he saw to be related largely to genetic propensities.[73] Taking Sowerby and Calverley combined, the infant mortality concentration appears to have been at least 40 per cent higher than in Jokkomok. An alternative approach to infant mortality clustering lies in the use of a binomial probability distribution to allocate elements of an indicative infant mortality rate to families of different sizes, allowing us to estimate what proportion of families one would 'normally' expect to account for, say, 50 per cent of all deaths. Using this approach and taking the infant death rate for the two townships combined in the key period 1750-99, we would expect 50 per cent of all infant deaths to be concentrated in 17 per cent of families rather than the observed concentration into 9 per cent of families.[74] There are fewer obvious ways of measuring the significance of concentration found in the other demographic variables, but the evidence suggests higher levels than would be expected on the basis of inherent population characteristics (such as genetic propensities) alone.

[72] As in Wrigley et al. *English population history*.

[73] Brandstrom and Sundin, 'Infant mortality'.

[74] This method was advised by Jim Oeppen and we were assisted in making the necessary calculations by Emmett Sullivan. Our thanks to each. As a rule of thumb, the higher the notional death rate applied, the greater would be the expected concentration of mortality. The infant death rate for the two townships combined for this period (1750-99) was 171 per thousand. Details of these calculations are obtainable from King@Brookes.ac.uk

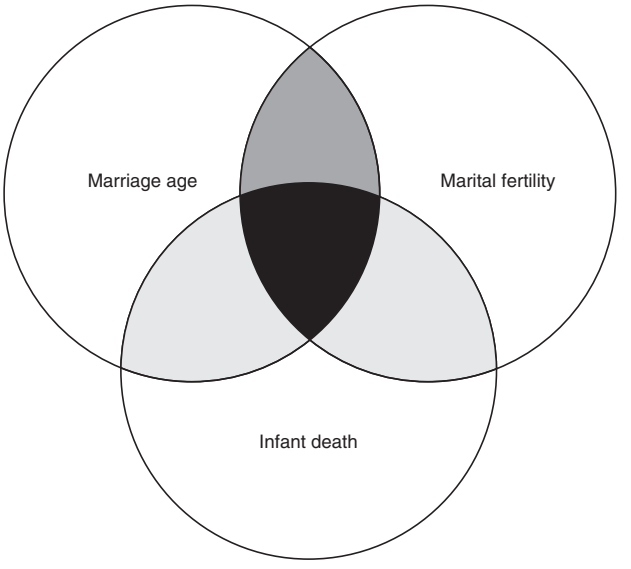

Figure 10. *Venn diagram representing case study overlaps between female age at first marriage, marital fertility (completed families), and high infant mortality experience, 1700–1800*

Note: cases: Female age of first marriage, 1817; fertility (completed families) 2,790; infant mortality 1,279. Case numbers where all three variables overlap: 396. Case numbers of overlap between high infant death and low marriage age but not marital fertility: 137. Case numbers of overlap of high marital fertility and high infant death but not low marriage age: 179. Case numbers of overlap between low marriage age and high marital fertility but not high infant death: 132

Source: Family reconstitutions

The degree of overlap between subgroups experiencing radical change in different aspects of demographic experience is important for our study but difficult to estimate precisely. Cohort evidence for both townships highlights significant congruence between subgroups particularly regarding PNP and high marital fertility. Of the group of women whose consistently low birth intervals served to push up aggregate fertility levels in Sowerby, 42 per cent had experienced PNP. Case studies provide additional evidence of a similar high degree of overlap in both townships between female age at first marriage, fertility (completed families), and infant mortality, as illustrated in figure 10. It appears that between a quarter and one-fifth of the population in each township experienced marked change in two or more aspects of demographic experience and that this restricted group was responsible for shifts observable in aggregate vital rates.

We thus need to explain the marked shifts in demographic experience

of small, identifiable, and largely overlapping subgroups. At the same time, we must also suggest why background demographic variables remained relatively stable in the townships. Extreme shifts require attention because of their impact upon arithmetical averages and measures of dispersal which are so much the focus of existing causal analyses. Change in marriage behaviour is a good exemplar here. By looking at occupational variations, it is possible to obtain clues to understanding the shifting core of extreme marriage behaviour which resulted in the emergence of a subset of young marriers in Sowerby, and the increasing rarity of late first marriage. Demographic patterns in Sowerby were disproportionately influenced by just one occupational group, weavers, although there were important divisions of experience within the group. Children from the wealthiest and most prosperous textile families appear to have married consistently late in the eighteenth century.[75] Those from proletarianized families married consistently early. Falling female marriage ages in Sowerby are largely to be explained by cumulative changes in the marriage behaviour of children from increasingly proletarianized weaving families, especially during the initial stages of commercial worsted expansion after the 1760s (table 2b). The growing core of early marriers may thus have been precipitated by positive, but often insecure, female proletarianization whilst the marriage ages of the bulk of young people in the community remained fairly stable.

In Calverley, clothier families dominated marriage patterns although, again, there were wide differences of experience. Males and females falling down the occupational scale at marriage appear to have been among the earliest marriers in the township.[76] There was no consistent analogue in higher marriage ages among those whose fortunes were stable or rising, except in the experience of the children of migrants and those marrying husbandmen. In-migrants married slightly later than the mean and were more likely to experience upward mobility at marriage. The female children of farming families appear to have married very early indeed, but the sons of farmers and the brides of farmers, who were not themselves drawn from farming families, appear to have married late (table 2a).[77] These extremes suggest that the same dynamic of proletarianization may have been at work in Calverley as in Sowerby but the process and its demographic impact appear more sluggish. It is likely to have been slowed and modified by the family-unit structure of the industry which could absorb some of the surplus proletarianized labour, especially young women, and, perhaps, more importantly, by the ease of migration into Leeds. The impact of proletarianization on marriage age is also likely to have been diminished by the existing norm of relatively

[75] This was assessed by comparing the families concerned with the size of poor rate payments and landholdings. More detailed investigation of these connections appears in Hudson and King, *Industrialization*.

[76] For this analysis, occupational ascription in any source within four years of marriage was used. Our assessment of what constituted 'falling down the occupational scale' is based on our study of occupational and earnings hierarchies in the two townships.

[77] For much more detail on this see King, 'Nature and causes'.

Table 2. *Female age at first marriage according to occupation of father and groom in Calverley and Sowerby*

(a) Calverley

Groom 1700-49						*Father*	*Groom 1750-99*					
Waged other	*Service*	*Waged textile*	*Craft*	*Farmer*	*Clothier*		*Clothier*	*Farmer*	*Craft*	*Waged textile*	*Service*	*Waged other*
22.4	23.6	23.0	24.0	23.0	22.4	Clothier	22.6	23.2	23.6	22.8	23.0	21.8
24.9	23.2	25.0	23.5	22.0	24.6	Farmer	24.9	22.4	23.0	n.a.	23.6	n.a.
n.a.	22.0	24.1	22.4	23.2	22.8	Craft	22.3	23.0	22.1	24.0	22.9	n.a.
22.3	n.a.	21.9	23.5	n.a.	22.9	Waged textile	22.3	n.a.	n.a.	21.9	23.6	20.9
n.a.	23.4	24.0	22.5	23.2	22.2	Service	23.0	22.4	22.9	22.0	23.0	n.a.
22	23.6	21.7	n.a.	n.a.	22.9	Waged other	22.8	n.a.	n.a.	21.7	n.a.	21.7
19	30	20	24	39	110	Cases	201	60	33	37	21	23

(b) Sowerby

Groom 1700-49						*Father*	*Groom 1750-99*					
No occupation	*Waged other*	*Service*	*Craft*	*Farming*	*Weaving*		*Weaving*	*Farming*	*Craft*	*Service*	*Waged other*	*No occupation*
24.3	23.7	24.2	24.0	24.2	23.7	Weaving	23.3	25.0	23.9	23.0	22.1	21.9
25.6	—	24.0	25.6	26.0	25.9	Farming	25.5	25.8	25.6	24.2	—	25.0
24.8	25.3	26.0	26.0	27.0	25.2	Craft	25.4	26.5	26.1	25.0	—	25.2
22.6	23.7	23.0	24.0	22.8	23.0	Service	22.8	25.0	23.7	23.0	22.0	21.2
21.8	22.1	—	22.0	—	21.6	Waged other	20.6	—	—	22.7	22.4	23.6
24.6	22.9	—	23.0	24.0	23.4	No occupation	23.4	26.0	24.0	22.3	21.0	21.6
40	22	47	43	21	140	Cases	259	27	48	63	111	53

Source: Family reconstitutions

Table 3. *The density of kinship in Calverley and Sowerby*

Sowerby			*Calverley*	
1750-1799	*1700-1749*	*Density of kinship*	*1700-1749*	*1750-1799*
30	40	Related to no other families	34	29
30	28	Related to 1 other family	29	28
20	16	Related to 2 other families	17	24
20	16	Related to 3 or more families	20	20

Source: Family reconstitutions. Figures indicate the percentage of families in the townships who are related to 0, 1, 2, and 3 or more other families within the same township either by blood or by marriage. Both vertical and horizontal connections are included. The kinship network is curtailed at the level of first cousins. The figures are based upon 19,000 discrete kinship relations.

early marriage. This may explain why it was the subset of late marriers whose behaviour was most affected. Young women made proactive choices to marry or to migrate: it was increasingly unattractive for single and proletarianized women to remain in the township.

That female marriage ages were more variable than male in both townships may be explained by the greater economic insecurities of young women whose wage-earning opportunities in both agriculture and domestic manufacturing were being squeezed in the later eighteenth century. Marriage as an economic necessity for a proletarianized subgroup of women was further endorsed by the low levels of poor relief provision in both townships and by relief policies which placed single able-bodied women as the lowest priority.[78] Denser networks of kinship in Calverley than those found in Sowerby (table 3) may have provided some support for adolescent girls and may thus have protected some from the economic necessity of very early marriage.[79] In both townships, however, lowering of the age of marriage, declining celibacy, and rising illegitimacy may all be largely explained by the reactions of those most affected by economic necessity and the behaviour of proletarianized, economically marginal young women appears to have been crucial in determining extremes of marital experience.

To some extent the restriction of significant shifts in fertility to an identifiable subgroup whose demographic experience was changing in other ways springs from two well-known demographic interlinkages. First, as one would expect, there was a feedback between high infant mortality and short birth intervals. Secondly, and more significantly, those who were pre-nuptially pregnant were predictably highly represented in the high fertility subgroup. However, these two links are only proximate and partial elements of explanation. The high fertility subgroup may have been a result of biological variation in fertility (including susceptibility to still births), or of greater frequency of penetrative and/or premarital sex for certain couples. That the subset of short birth interval mothers

[78] *Idem*, 'Reconstructing lives'; *idem*, 'Nature and causes'; Sowerby settlement examinations and certificates, SPL 94.

[79] Poor relief policies and the positive role of kinship support in Calverley are fully explored in King, 'Reconstructing lives'.

increased in the later eighteenth century is also compatible with changes in breast feeding which are likely to have accompanied changes in women's work. The growing self-exploitation of the family economy and the move to workshops and some factories for spinning, which separated the home from the workplace, probably made breast feeding more difficult and early weaning essential. This might explain the overlap between high fertility and high mortality subgroups. Additionally, a decline in the number of stillbirths may have played a significant role in generating higher fertility in certain families though not as great as that suggested by Wrigley for the country as a whole. For the two townships combined, endogenous infant mortality (death in the first month of life and hence largely a result of poor maternal nutrition or genetic factors) fell from 96 per thousand births (live and dead) in 1700-24, to 64 in 1800-24 which compares roughly with Wrigley's national figures of 100-125 per thousand at the end of the seventeenth century and 40 per thousand by the early nineteenth century.[80] Finally, high and rising fertility was most strongly associated with those weaving and clothier families who were not major land or wealth holders and who did not have strong kinship links. A disproportionate number were also first-generation migrants. This suggests the importance of a range of economic factors in encouraging high reproduction rates in certain population subgroups, with the impact of proletarianization featuring very strongly.[81]

These sorts of influences also appear to have been important in identifying the high mortality subgroup. High and deteriorating mortality levels in our townships may potentially be explained by the usually invoked effects of industrialization: trade fluctuations, job insecurity, work conditions, poor public health and hygiene, increased exposure and reduced resistance to disease, or by poor childcare practices. But if these general factors were important why was their impact so unevenly distributed? The high infant and child mortality experiences of certain families were linked to low birth intervals and hence to high fertility, as we have seen.[82] More significantly, the clustering of high infant deaths in certain families in both townships appears to have been closely linked to economic and geographical position. Case studies show a close association between high infant mortality, illegitimacy, economic marginality, migrant status, and the absence of local kinship. Lack of kinship networks, particularly associated with inmigrants, appears to have been a more important factor than occupation, status, or other indications of economic marginality per se. Just as important, in Calverley in particular, was the association

[80] This calculation was made after eliminating dummy variables from the analysis, making the figures compatible with Wrigley's national-level estimates for endogenous infant mortality: Wrigley, 'Explaining the rise in marital fertility'. Elimination of the dummy variables does, however, reduce sample size for our township study and makes the exercise and the comparison somewhat questionable.

[81] Calverley and Sowerby, provisional reconstitution results.

[82] Mortality extremes also appear to have been clustered in families sufficiently strongly to suggest the sort of genetic explanation identified by Brandstrom and Sundin, 'Infant mortality'. Wrigley suggests that genetic factors in infant mortality experience became less important in the second half of the eighteenth century in England, which may be reflected in our figures.

between very poor mortality experience and residence in the low-lying and damper riverine areas of the township which were near to the main thoroughfares and thus more susceptible to the spread of infections.[83]

The 'artificiality of the conventional separation of demographic behaviour into fertility, mortality and nuptiality'[84] is highlighted by these findings, in particular by the stress which we place on the impact of overlapping sub-groups of extreme experience. A key question regarding major shifts in demographic behaviour must be how proletarianization and associated population mobility impacted differentially upon men, women, and families in terms of job security, employment on the margins of waged work, the domestic role, child nurturing, and the pressures and time constraints upon women. The proactive responses to such circumstances on the part of families and individuals, in particular young women, also appear to lie at the heart of demographic changes in the two townships.

The relative stability of background variables of nuptiality, fertility, illegitimacy, and mortality in Sowerby and Calverley is as important as the changes and also requires explanation. Rural industry enabled more people to live out their lives in the community rather than migrate away and hence both to have larger and stronger kinship networks and, other things being equal, to be influenced more by communal norms and practices than might otherwise have been the case. Table 3 which sets out estimates of kinship density over time for both places suggests that demographic life-cycles, processes of proletarianization, courtship, experiences of poverty, and continuity and change in intergenerational relationships were played out against a backdrop where individualized decision making, so central to ideas about the cultural impact of modernization, capitalism, and proto-industry may have been subject to an increasingly powerful variety of familial and social constraints.[85] This factor in itself may have endorsed the relative stability of demographic behaviour among the majority of township residents despite economic transformations and increased in- and out-migration.[86]

In addition, although Seccombe has made an important contribution to our understanding of demographic change by distinguishing between positive and negative proletarianization, we contend that proletarianization can also be seen to act in a neutral manner.[87] Where a drift to landlessness and wage earning is a function of demographic increase itself and is accompanied by a growth in manufacturing earning opportunities, it becomes significant in stabilizing rather than changing the economic and

[83] King, 'Dying with style'; Hudson and King, 'Industrialising townships'; King, 'Profitable pursuits?'.

[84] Wrigley, 'Explaining the rise in marital fertility', p. 460.

[85] See Hudson and King, 'A sense of place' and, for an exploration of these factors in a different context, King, 'Chance encounters'.

[86] The increased residential stability of core groups in the populations of industrial regions in the later eighteenth century was noted by Deane and Cole, *British economic growth*, pp. 106-22. The industrial West Riding as a whole experienced relatively little in- and out-migration between 1750 and the early nineteenth century.

[87] Seccombe, *Millennium of family change*.

demographic experience of communities. Finally, the existing social and cultural character of a community, including the nature of social and demographic reproduction, household formation, familial and social networks, living arrangements, family economies, social and wealth structures, and local governance were themselves powerful agents of economic continuity as well as economic change. Local circumstances did much to mould and underpin industrial and commercial developments including all types of proletarianization and proto-industry.[88] Industrialization developed alongside, adapted to, and was also promoted or retarded by, the existing and evolving character of place.[89] An enduring sense of place, of local knowledge, networks, and understandings, underpinned many aspects of life including demographic behaviour. As is the case with globalization in the late twentieth century, the economic and cultural distinctiveness of regions and localities does not decline or disappear in the face of wider economic forces, but is often endorsed because it provides both a cultural anchor and the foundation upon which places find a niche in new conditions.[90]

IV

Several comparative conclusions can be drawn from our analysis which help to illuminate wider demographic processes. First, there appear to have been two tiers of proto-industrial area in England in terms of infant mortality. Sowerby and Birstall experienced 'continental levels' of mortality, while in Shepshed, Gedling, and in particular in Calverley, the mortality regime was more muted, if still intensive. Second, these differing mortality experiences took place against the backdrop of a variable rise in marital and total fertility. Sowerby, Gedling, and Shepshed saw marital fertility rise, but this movement was of a different order to the very significant increase seen in Calverley and to a lesser extent in Birstall.[91] Third, as the continental literature on proto-industry has been suggesting for some time, there was no uniform relationship between nuptiality and rural industry. Calverley in particular bucked the national trend of falling marriage ages, and in Sowerby the fall was relatively modest. Fourth, there were great variations in illegitimacy: Calverley witnessed a fall in the percentage of illegitimate births as consistent as the rise in Sowerby.

[88] Such initial conditions were partly responsible for the development of putting out and artisan structures in distinct parts of the textile area; see Hudson, *Genesis*, ch. 3.

[89] Support for this view with respect to West Yorkshire is found in Heaton, *Yorkshire woollen and worsted*; Hudson, *Genesis*; Caunce, 'Community structure'; Pearson, 'Knowing one's place'. With respect to Calverley and Sowerby, see Hudson and King, 'A sense of place'.

[90] There is a vast literature on this subject but useful collections of articles and ideas can be found in Amin and Thrift, *Globalization, institutions and regional development*; Miller, ed., *Worlds apart*. In the context of Sowerby and Calverley these factors are further explored in Hudson and King, 'A sense of place' and Hudson and King, *Industrialization*.

[91] The Birstall figures appear to suggest a rise of fertility similar in magnitude to that in Calverley but there remain doubts over the accuracy of the reconstitution and the figures have thus not been presented here. See Wrigley et al., *English population history*. For a suggestion of fertility rates considerably higher than that found in the rural sample employed by Wrigley et al., see Reay, *Micro-histories*.

Finally, and most importantly, our study has shown that below the surface of the overall indicators for the communities themselves lurked contrasts in experience between identifiable subgroups, cohorts, and families. These were of such importance that marked shifts in 'average' demographic variables should not be assumed to reflect a common experience. Averages of vital rates emerged from a combination of marked change for a minority of the population and relatively stable behaviour and experience for the rest. For this reason we suggest that one important way forward for research into the causes of demographic change in British communities and regions in the period of industrialization lies in the use of micro-social data and event histories relating to individuals and family groups. This will enable the gradual reconstruction of collective biographies and the identification of causal factors in the population histories of communities 'from below'.[92]

The broad outlines of demography in our two textile townships do not undermine the idea that proto-industrial communities looked 'different' from other types of community and that they shared certain similarities. In this sense our research is very much a complement to the macro-level theorizing of the Cambridge Group and of Seccombe, Levine, Mendels, and others. These were often high pressure demographic systems experiencing some, but not always all, of the following features: falling marriage ages, an increasing rate of marriage, an increase in procreative activity outside marriage, rising marital fertility, and rising (also by the later eighteenth-century comparatively high) infant and childhood mortality. These features underpinned the frequently experienced 'demographic hothouse' of rural industry. But our research has also demonstrated variations of experience and behaviour, both between and within communities, of such importance that conventional or uniform explanations for their character and trends, which appear attractive at the level of typology construction, are not easily applicable. Historical demographers have thus far largely ignored the importance and nature of subgroups whose behaviour is difficult to relate to a *general* economic climate involving such factors as real wage movements, degrees of wage dependency, or dominant occupation. Our findings suggest that this is unfortunate. A parallel part of our research involves delving further below the surface both of subgroup experience and of continuities of behaviour to ask exactly how and why they came about. In the process we place less emphasis upon the primacy of generalized economic forces and more upon the power of human relationships, rooted in local vernaculars, to shape their own history.

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[92] This is the sort of approach taken (for a different purpose) by Pooley and Turnbull, *Migration and mobility*. They use 17,000 individual family histories as a basis for new generalizations about the determinants and trajectories of migration after 1800.

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