THE
ECONOMIC HISTORY REVIEW

ORIGINAL ARTICLE

Beyond the male breadwinner: Life-cycle living standards of intact and disrupted English working families, 1260–1850

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Abstract

This article provides a novel framework within which to evaluate real household incomes of predominantly rural working families of various sizes and structures in England in the years 1260–1850. We reject ahistorical assumptions about complete reliance on men's wages and male bread-winning, moving closer to reality by including women and children's contributions to family incomes. Our empirical strategy benefits from recent estimates of men's annual earnings, so avoiding the need to gross up day rates using problematic assumptions about days worked, and from new data on women and children's wages and labour inputs. A family life-cycle approach which accommodates consumption smoothing through saving adds further breadth and realism. Moreover, the analysis embraces two historically common but often overlooked family types alternative to the traditional male-breadwinner model: one where the husband is missing having died or deserted, and one where the husband is present but unwilling or unable to find work. Our framework suggests living standards varied widely by family structure and dependency ratio. Incorporating detailed demographic data available for 1560 onward suggests that small and intact families enjoyed high and rising living standards after 1700, while large or disrupted families depended on child labour and poor relief

until *c.* 1830. A broader perspective on family structures informs understanding of the chronology and nature of poverty and coping strategies.

Trends in well-being have long been debated by economic historians, not least in the English context. From start to finish, contributions to the debate shared major shortcomings. A key weakness is that investigations associated family income with the *husband's* earnings *alone*, implicitly assuming away any contributions from other family members. Yet the idea of a pre-modern male breadwinner, solely responsible for family support, sits awkwardly with the historical evidence of women and children's extensive economic activity including participation in wage labour.[1] Discussions of living standards have acknowledged the fallacy built into this patriarchal perspective and the need to incorporate the contributions of women and children to understand family well-being properly, while rationalizing slow progress by reference to inadequate historical evidence. Welfare measures based directly on accounts of total family resources have been considered over discrete periods (for instance, the industrial revolution),[2] but allegedly thin source material, particularly covering female and child labour, impeded their replication over the long run. Secular perspectives collapsed back onto male wages as the lone indicator, and, compounding this error, relied on male *day* rates, grossed up using unfounded assumptions about a constant 250-day working year to benchmark annual earnings. This article offers an empirically based and ideologically unfettered perspective by aggregating family incomes from the contributions of *all* family members of rural households. It is made possible by recent progress in assembling historical wage series for men based directly on annual earnings and for women and children based on both annual measures and day rates grossed up according to estimates of labour inputs.[3]

A second key weakness of the conventional account is a focus on the family at a *single* phase in its progression, usually the stage of peak pressure when children are young and probably dependent. Inspired by the studies of Sokoll, Schneider, and Boter,[4] we take a *family life-cycle* approach, looking at the resources that families could command across all phases from youth through family formation to old age, and locating longitudinal experience in historical time. Thus, for every decade, 1260–1850, we can describe the situation of the family as independent adolescents join

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[1] For example, Horrell and Humphries, 'Women's labour force'; easdem, 'Exploitation of little children'; Berg, 'Women's work'; Berg and Hudson, 'Growth and change'; Tuttle, *Hard at work*; Sharpe, *Adapting to capitalism*; Burnette, 'Laborers at the Oakes'; eadem, 'Female day-labourers'; Honeyman, *Child workers in England*; Humphries, *Childhood and child labour*; Humphries and Weisdorf, 'Wages of women'; Horrell and Humphries, 'Children's work and wages'.

[2] Horrell and Humphries, 'Alternative perspectives'.

[3] Humphries and Weisdorf, 'Wages of women'; eisdem, 'Unreal wages'; Horrell and Humphries, 'Children's work and wages'.

[4] Sokoll, *Household and family*; Schneider, 'Real wages and the family'; Boter, 'Living standards and the life-cycle'.

together as newly-weds, children are born, then grow and soon strike out on their own, leaving the elderly couple alone again. Here we follow the strategy initiated by Schneider, but incorporating the new earnings data, notably those of women and children, and following a longer timespan. Moreover, allowing savings when young to be carried forward into the next phase, as in earlier work by de Moor and Zuijderduijn,[5] means that we can gauge the extent to which they might offset deficits when dependency created pressures on current earnings.

The initial step of our analysis considers the commonly used, average-sized, intact family. This traditional focus, however, misrepresents the living standard of larger and less fortunate households. Indeed, the stylized family traces a gilded life, rare in a real world where death, disease, under- and unemployment, and mere human frailty stopped adults, in particular, from providing support at the rates assumed, or extraordinary fertility and larger numbers of surviving children created pressures on household resources even if earnings were as prescribed. Individual and personal vulnerabilities were matched by existential threats. Long-term macro-economic circumstances ebbed and flowed, with unlucky cohorts struggling to secure employment or earn a living. Technological change rendered hard-won skills redundant[6] and threatened whole occupations resulting in unemployment and loss of family income.[7] Military campaigns pulled men from their families and disrupted support.[8] The commonly used assumptions, replicated in our initial analysis, protect the stylized family from these potential problems and make their lives look excessively rosy. Such fortunate experience appears inconsistent with the grim features of early modern historical experience; for example, the extensive use of child labour[9] and skyrocketing expenditures on poor relief in the industrial revolution.[10]

Fortunately, detailed demographic evidence for 1541–1850 enables us to get beyond the standard case to consider other realistic scenarios. Schneider demonstrated the value of incorporating greater demographic realism,[11] but without data on women's and children's earnings it was not possible for him to establish trends in well-being for a more grounded multi-earner family. Our new earnings evidence overcomes this obstacle, combining with the demographic data to trace changing fertility and dependency in the context of family incomes. Moreover, incorporating a richer demographic context enables us to address a third key weakness in existing accounts and to take further steps towards greater realism by bringing into focus historically common family types that have been crowded out by the fixation on the male breadwinner model: where fathers had died or abandoned their families; and, where fathers were present but unable or unwilling to earn at the levels assumed in the standard model. In short, we use the intact-family setting as a stepping-stone for offering a comprehensive picture of family living standards through the family life cycle, over the long run, and allowing for a wide range of family sizes and structures.

Our more refined and realistic account of family welfare identifies secular, cyclical, and individual sources of distress. Thus, consistent with medievalists' accounts, the century before the

[5] de Moor and Zuijderduijn, 'Preferences of the poor'.

[6] de Pleijt and Weisdorf, 'Human capital formation'.

[7] Humphries and Schneider, 'Spinning the industrial revolution'.

[8] Greenwood, 'British loss of life'; Kent, '"Gone for a soldier"'.

[9] Horrell and Humphries, '"Women's labour force"'; Tuttle, *Hard at work*; Honeyman, *Child workers in England*; Humphries, *Childhood and child labour*; eadem, 'Child labour'.

[10] Arkell, 'Poverty in England'; King, *Poverty and welfare*; Lindert, 'Poor relief'; Newman-Brown, 'Receipt of poor relief'; Wales, 'Poverty, poor relief, and life-cycle'; Williams, 'Poor relief'.

[11] Schneider, 'Real wages and the family'.

Black Death emerges as testing. Even our fortunate baseline family had to call on child labour to reach respectability or fall back on a bare-bones living. Other eras, too, proved challenging to their unlucky cohorts. The late 1500s and early 1600s deserve further attention as hard times, while the Civil War appears to have blighted the generation of the 1640s. In between, the golden age associated with the labour scarcity created by the Black Death and slow demographic recovery shone on family life chances. Once we step away from the baseline scenario to explore alternative family sizes and structures, the impact of individual tragedies, personal failings, and sheer bad luck is superimposed on these macro trends. Understanding the interaction between family sizes and structures and the economic context remains a task for the future, as does the question of the degree to which labour supply and demand always matched. However, the frequency of large or fatherless families and incompetent or missing breadwinners begins to explain historical developments such as the boom in child labour during industrialization and the massive growth in poor law expenditure in the late eighteenth and early nineteenth centuries, developments that have been hard to reconcile with trends in the day wage rates of male adults. Consideration of the many types of families that existed and how their experiences changed over their own life cycles complicates but enriches our understanding.

I | WAGES, LIFE CYCLES, FAMILY STRUCTURES, AND CONSUMPTION NEEDS: THE BUILDING BLOCKS OF OUR MODEL

I.I | The wage data

Our wages for men, women, and children are those collected and published in recent articles by Horrell, Humphries, and Weisdorf.[12] For men, throughout, we use the wages earned on long-term contracts mainly by rural unskilled workers in a variety of occupations (mainly servants, labourers, and farm workers). The wage index was based on more than 6 000 payments, with roughly one-fifth from the medieval period.[13]

Workers on long-term contracts, which we denote *stable* workers, made up a substantial fraction of the unskilled male workforce depending on the period of observation.[14] The remaining unskilled male labourers worked casually for day wages. Since we do not know the length of the casual working year, and so cannot with any certainty estimate annual incomes from day wage rates, a problem highlighted in numerous studies,[15] we assume with Clark and van der Werf that casual workers earned roughly the same as stable workers *over the year*.[16] This assumption is underpinned by arbitrage, that is the willingness and ability of both workers and employers to substitute between types of employment to obtain higher wages or lower costs per unit of labour.

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[12] Humphries and Weisdorf, 'Women's wages', tab. A1, Wages in pence per day of Unskilled men and women, by decade (casual and annual workers); 'Unreal wages', online app. Tab. A.2, Annual wages, implied income, by decade; Horrell and Humphries, 'Children's work and wages', app. A3, Cash wage, d. per day, by decade.

[13] See online app. tab. S1 for the distribution of the wages data by century.

[14] Humphries and Weisdorf, 'Unreal wages'.

[15] See Allen and Weisdorf, 'Was there an "industrious revolution"?'; Hatcher, 'Seven centuries'; Hatcher and Stephenson, *Seven centuries*.

[16] Clark and van der Werf, 'Work in progress?'.

Thus, regardless of whether a husband worked for casual or stable wages, his *yearly* earnings are best approximated by the annual wages reported by Humphries and Weisdorf.[17]

The difference between using the traditional annual income estimates from day wages (assuming the working year was always 250 days long) and the annual incomes from annual employment used here is shown in online appendix figure S1. The graphs suggest that women and children's earnings were needed much more before the eighteenth century than earlier work has proposed, especially during the post-Black Death period when the new (annual-income) welfare ratio falls below one, but also that English male workers earned even more after *c.* 1700 than indicated in previous studies. Further details are given in Humphries and Weisdorf's recent article about male annual wages, which argues that the working year of casual workers was habitually either longer or shorter than the commonly assumed 250 days.[18]

For women, things are different. In their article on women's wages,[19] Humphries and Weisdorf argue that single women usually worked in stable jobs, but on marriage moved to more flexible casual work. To capture these marital-status-dependent labour-market attachments, we use *annual* wages in the case of *single* women and *daily* wages in the case of *married* women. Both series, covering 1260–1850, are provided by Humphries and Weisdorf.[20] Like those of men, women's occupations concern unskilled work both for casual and annual employment. The wage indices for women reported by Humphries and Weisdorf were built on the basis of *c.* 2 000 payments for casual work and *c.* 4 000 payments for annual work. About one-fifth of these payments concern the medieval period.

For women's labour inputs, we have amassed detailed evidence from a variety of commentators and documentation of individual women's work to estimate married working-class women's labour force participation and the number of days worked by these women in a year for the period 1280–1850, allowing a proportion to work less than full-time.[21] In brief, prior to the Black Death, women were relatively rarely seen to work for wages. McIntosh, for example, counted 10 days a year at Ebury Manor,[22] though it is difficult to say whether more work was obtained elsewhere. Employment was modest even during the post-Black Death labour shortages, when Mate observed married women working 53 days annually at Chalvington, Essex, in 1441, so close to one day per week on average across the year.[23] Moving forward in time, Elizabeth Dyson and Ann Parkinson, employed at the Oakes farm during the early modern period as documented by Burnette, worked 112 and 124 days per annum, respectively.[24] Two mid-nineteenth-century wives, recorded by le Play, worked 48 and 112 days, respectively. Again, these numbers suggest that women's labour inputs were around one or two days weekly per year.[25]

Adding to this, Horrell and Humphries found that 35 per cent of wives mentioned in household budgets from 1750 to 1850 undertook regular work, 25 per cent had intermittent employment, and

[17] Humphries and Weisdorf, 'Unreal wages'.

[18] Ibid.

[19] Humphries and Weisdorf, 'Wages of women'.

[20] Ibid.

[21] See Horrell, Humphries, and Weisdorf, 'Family standards of living'.

[22] McIntosh, *Working women*, p. 24.

[23] Mate, *Women in medieval English society*, pp. 30–1.

[24] Burnette, 'Laborers at the Oakes'.

[25] le Play, *Les ouvriers européens*.

the remainder had no paid work.[26] Our assumption that a married woman worked one day per week when her family was in its early life-cycle phases and two days per week at other times seems representative, at least from the early modern period forward. At any rate, the estimates represent a starting point until more accurate data become available. We have used these estimates throughout the extended period under study, except when the family lacked an income-generating husband when we assume that the wife worked full-time.

Children are also observed working on both annual and casual contracts.[27] Analysis of the children's wages dataset and observations of children's work from other sources, such as household budgets and local censuses, reveal no straightforward distinctions in the type of payment system used for children: age, occupation, sector, and family structure were all factors. Their wages, close to 4 000 in total, with one-sixth relating to the medieval period, were observed in all sectors of the economy, though mainly agriculture. To capture a representative child, we use the average cash wage paid per day in each decade.[28] Children's labour inputs are endogenized in our subsequent analyses, as we explain later.

I.II | Wage earning and land-holding households in the medieval period

Our focus on the earnings of individual household members over the long run, 1270–1850, might be challenged, for the earlier centuries at least, on the grounds that small-scale agriculture rather than wage labour dominated income generation. Can our wage series be deemed to represent the living standards of those who lived mainly from the land?

Historians generally agree about the depth of rural immiseration in the late thirteenth and early fourteenth centuries. Before the Black Death there had been extensive fragmentation of the customary 'virgate' or 'yardland', the 30 acres deemed necessary for a small farmer to be self-supporting, leaving one-third of villein tenants with holdings of five acres or less.[29] Fragmentation was even greater among free tenants.[30] The most recent estimates suggest that *c.* 1290, some 40 per cent of all households were landless or land poor, holding less than three acres.[31] Of the rest, 27 per cent had holdings of 12 acres on average while only 16 per cent could be classified as 'yardlanders' with holdings around 30 acres.[32] If, following Bennett's summary of an extensive literature,[33] we take 15 acres as the minimum needed by a family of five to maintain a basic standard of living, over three-quarters of all landholders (smallholders, cottagers and agricultural labourers, rural craftsmen, and so on) had to supplement their arable farming in order to survive. They tended market gardens, reared livestock, brewed ale and beer, and, importantly, worked for wages as

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[26] Horrell and Humphries, 'Women's labour force', tab. 1.

[27] Horrell and Humphries, 'Children's work and wages'.

[28] See ibid., app. A3, col. 1.

[29] Kosminsky, *Agrarian history*.

[30] Beckar and Reed, 'Land markets and inequality'.

[31] Calculated from Campbell, *Great transition*, tab. 3.4. We have converted hectares to acres and combined categories. The difference is explained by inclusion/exclusion of men-at-arms, fishermen, and sailors, who Campbell assumes were landless.

[32] Substantial tenants, landowners, minor clergy, and so on, made up the remaining households.

[33] Bennett, 'Wretched girls'.

casual labourers and in occupations such as thatching and carting. Around one-third of people had their livings based on waged labour even at the beginning of our period.

After the Black Death, more people had access to land and holdings increased, but the demand for labour also boomed.[34] Large tracts of unused land and deserted villages imply that peasants enjoyed options other than agriculture, and surely compared the higher wages on offer with returns to smallholding, ensuring arbitrage as other authors have suggested.[35] We can demonstrate the near-equivalence of these options by turning to some historical sources. Dyer uses the accounts of Cleeve Manor (Worcestershire) in 1299 and 1475 to document the incomings and outgoings of a five-person family with different sizes of landholding, showing either the surplus generated from the various agricultural activities or the number of days of wage labour needed at the going rate for the family to achieve subsistence.[36] For instance, in 1299 a smallholder with three acres would need to work for others at the daily wage rate of 1.5d. for 130 days to ensure barebones subsistence for his family, whereas a yardlander tilling 30 acres would be able to earn £1 cash surplus in the year and ensure a respectable family standard. These accounts can be used to calculate family welfare ratios for landholdings of different sizes by deflating by the cost of a 'family basket' conventionally assumed equivalent to the cost of three individual respectability baskets.[37] We explain the calculating procedure in greater detail later.[38]

Similar computations can be made for Kitsikopoulos's reconstruction of a family holding of 18 acres for 1300–50,[39] and for Hatcher's reconstructions for 1348–9 and 1450–79 for landholding ranging in size up to 36–40 acres.[40] These welfare ratios from landholding are compared in figure 1 with the earnings of a man on an annual labour contract, assuming again that he needed a family basket (comprising three individual respectability baskets) to support his family. The close correspondence between the welfare provided by an annual wage and what could be achieved from a smallholding supplemented by additional activities is evidence of arbitraging decisions and suggests that the wage series are a useful proxy for the incomes of small farmers in the medieval period and thus capture the fortunes of the majority of the population.

Of course, the proportion of the population dependent on wages rose inexorably over subsequent centuries,[41] putting reliance on combined family earnings as the primary determinant of living standards on an ever firmer footing. According to Allen's recent revision of occupational structure derived from the famous social tables of King, Colquhoun, and Baxter, 'Workers' made up 56 per cent of families in 1688, 61 per cent in 1798, and 66 per cent in 1867, proportions that rise to 65 per cent, 76 per cent, and 71 per cent, if we include 'Cottagers and paupers' as wage-dependent.[42]

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[34] Dyer, *Standards of living*.

[35] Hatcher, 'Seven centuries'.

[36] Dyer, *Standards of living*.

[37] For full details, see Horrell et al., 'Family standards of living'.

[38] Ideally, we would want to compare welfare from annual *family* earnings with that from *family* work on the land. However, computations from medieval sources note but rarely monetize the contributions of women and children, instead focusing on the output from the man's work on the holding supplemented by any wage labour he may additionally have been able to undertake. Thus, they are more appropriately compared with male annual earnings alone and in all cases therefore represent conservative estimates of family welfare.

[39] Kitsikopoulos, 'Standards of living'.

[40] Hatcher, 'Seven centuries'.

[41] Everitt, 'Farm labourers'.

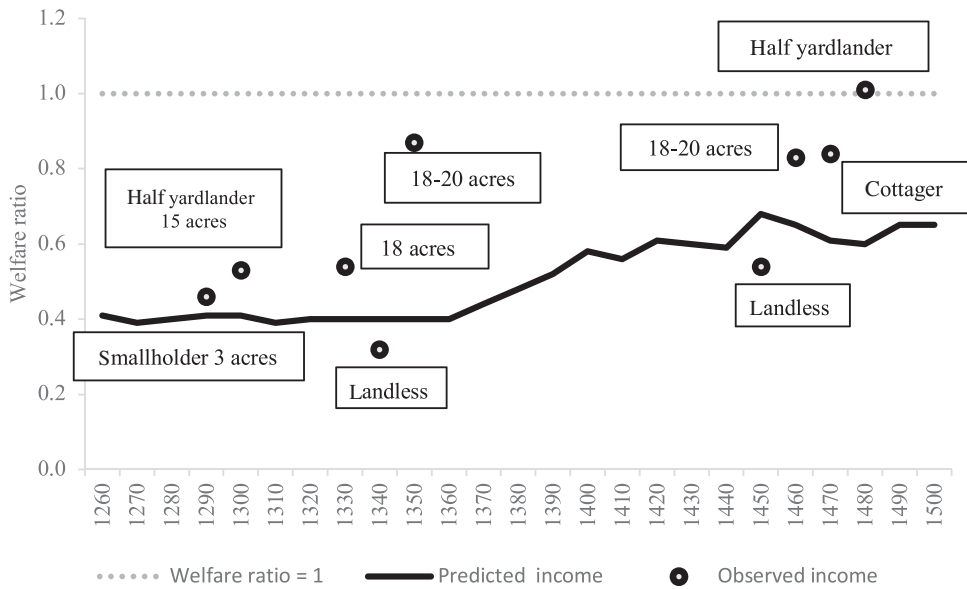[42] Allen, 'Class structure', p. 105.

FIGURE 1 Welfare from annual wages and from land-holdings. *Source:* Male annual earnings and cost of respectability basket, Humphries and Weisdorf, 'Unreal wages', app. A; individual data points as described in text

I.III | The life-cycle model

We consider three main phases of a couple's life: first, youth and independence (from age 15 to age 25); second, marriage and child-raising (from age 25 to 55); and third, post-child-raising including old age (from age 55 to age 75). These three phases, broken down into six life-cycle stages below, are consistent with those identified by Seebohm Rowntree in his late nineteenth-century investigations of the extent and incidence of family poverty.[43] The waged-labour activities during each of the six life-cycle stages are also detailed later. To begin with, in order to explore what happens beyond the child-raising years, we consider a long-lived couple where both adults are capable of working and survive until the age of 75. Our baseline family merely serves as a reference point. Later, we expand our analysis to cover threats to the integrity of the family structure; for example, where the husband was unable or unwilling to provide support or died during the child-raising years.

For our baseline analysis, and before we draw on actual fertility data to model the pattern of births, we require assumptions about family size and the spacing of births. The latter is necessary to demarcate the length of the parenting period and to identify when children were able to participate in waged labour. To this end, in our initial stylized model we follow Allen and assume the family consists of two adults and three children,[44] spaced five years apart or roughly twice as long as the average spacing observed among early modern English couples.[45] Since here we only consider the influences on the family's budget of surviving children, we implicitly assume therefore

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[43] Rowntree, *Poverty*.

[44] Allen, 'High-wage economy'.

[45] Cinnirella, Klemp, and Weisdorf, 'Malthus in the bedroom'.

that every other new-born did not survive infancy and so never became a significant financial burden or a (later) source of income. We relax both these assumptions when we introduce evidence of actual family sizes from 1541 onwards.[46]

The six life stages look as follows. The first stage, which we call *youth*, begins with independence at the age of 15 and ends when a marriage is contracted, usually around the age of 25.[47] During *youth*, we assume that the man and woman are both employed full-time and reckon their yearly earnings according to the prevailing annual wage to avoid distorting assumptions about the length of the working year as explained above. After marriage, the wife reduces her wage labour to accommodate child-raising and domestic work.[48] As explained above, we assume that married women work for wages one day each week on average for 50 weeks each year during the first two decades of the couple's parenting years, that is, between ages of 25 and 45, as the family transitions from its *young-family* stage (age 25 to 35) into the *peak-family* stage (age 35 to 45).

Next, the couple enters the fourth *old-family* stage of their life cycle (age 45 to 55). During this stage, family size begins to shrink. Since there were normally no further births during this last decade of parenting, we assume that the wife increases her days of labour from one to two weekly, participation that she maintains during the subsequent (and fifth) *post-family* stage (age 55 to 65), when all children are assumed to have left home. The husband, meanwhile, continues to work full-time. Finally, in the sixth stage (*old age*), the couple (now aged 65 to 75) gradually reduce their previous life-cycle labour input, so that it reaches zero when their lives end aged 75. In this final phase, we thus assume that the husband works 50 per cent of full-time while the wife reverts to one day per week for 50 weeks.

Having defined the different life-cycle stages and their associated labour inputs, we now return to our interest in how much labour resident children had to supply to make ends meet. We assume that children did not enter the labour force until they were aged six and that they became independent at age 15. To simplify further, we rule out intergenerational transfers. Children over 15 neither remit earnings to their families of origin, nor receive support including bequests on their parents' death. We do allow savings, where a surplus is earned beyond immediate consumption needs, to be carried over from one life-cycle phase to the next, but these savings are assumed not to yield interest. We also assume that there is no (long-term) borrowing.

I.IV | Savings: The institutional context

To what extent was saving between periods a realistic strategy for ordinary families? We first consider how and in what form young people could accumulate as a contingency against later pressures. In the medieval and early modern period, many young people worked as live-in servants. The cash component of their wages was usually due annually or quarterly, but could be advanced or deferred. Shortages of coin to make payments and difficulties of safeguarding small accumulations meant that employers often persuaded servants to agree to the retention of wages as accumulated credits, often over many years.[49] For example, servants' probate inventories suggest that

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[46] Wrigley, Davies, Oeppen, and Schofield, *Family reconstitution*.

[47] Boberg-Fazlic, Sharp, and Weisdorf, 'Survival of the richest', fig. 5.

[48] See Humphries and Weisdorf, 'Wages of women'.

[49] Kussmaul, *Servants*, pp. 38–9; Youngs, 'Servants and labourers'; Muldrew and King, 'Cash'.

arrears of pay in 1550–1800 ranged between £20 and £41.[50] These credits might be enhanced by commutation into keep for livestock or occasionally by the payment of interest by employers who had interim use of the funds,[51] though more usually they were simply retained until claimed. Sarah Fell's account book illustrates lending to and borrowing from servants well into the seventeenth century. For example, Richard Radcliffe might have been a 'menial servant' but he received over £70 in 1678 'owed him upon bond'.[52]

On leaving a post, savings were often used to purchase tools or a new wardrobe with which to follow an industrial occupation or compete in the market for domestic servants. Such durables retained their function as a store of value to be drawn upon in more pressing times: tools, household goods, even clothing offered current services but could also be sold for cash or pawned.[53] Lambrecht, for example, reminds us that the frequent appearance of clothing in records of servants' expenditure should not be viewed as conspicuous consumption as it could later be refashioned to fit children or sold on through the ubiquitous second-hand markets of the time.[54] Parents, or other trusted adults, could also retain savings until needed but it was only at the end of our period that savings banks accessible to and trusted by working people began to appear.[55] Most commonly, savings in *youth* were used to form an independent household with all its associated expenses.[56]

At the other end of the life cycle, we consider whether older people accumulated sufficient to tide them through reduced productivity and possible incapacity. Mechanisms were in place from the earliest times to finance old age. In medieval England, some parents passed land, farms, and equipment on to their children on the understanding that they would then provide adequate maintenance for the remainder of their parents' lives.[57] Such personalized strategies for maintenance were recorded in the lord's court and provide fascinating detail on the composition of respectable living and contract enforcement. Thus, in 1408, one widow surrendered her customary land to her son in exchange for one quarter of faggots valued at 12d. yearly for life plus 8s. paid quarterly, two rooms fully repaired, and the same food and drink enjoyed by her beneficiary.[58] If the fare was not to her liking she was to be compensated with a further 12d. to cushion her displeasure. Such contracts did not cease in the early modern era when men and women even in humble circumstances continued to cede property to heirs prior to death in exchange for maintenance.[59] Even without contracts for maintenance, collections of household goods accumulated over a lifetime were used as collateral when the elderly sought poor relief, with the authorities sequestering pauper inventories as payment against support.[60] Saving, and the resultant consumption smoothing, were strategies adopted by ordinary people over the life cycle.

[50] Muldrew, 'Credit to savings', p. 407.

[51] Youngs, 'Servants and labourers'; Lambrecht, 'Institution of service'.

[52] Penny, *Sara Fell*, p. 526.

[53] Shepard, *Accounting for oneself*.

[54] Lambrecht, 'Institution of service', p. 49; Styles, 'Involuntary consumers?'.

[55] Horne, *Savings banks*; Ismay, *Trust among strangers*.

[56] Kussmaul, *General view*, p. 17.

[57] Clark, 'Social security'; Dyer, *Standards of living*, pp. 151–2.

[58] Cited in Clark, 'Social security', p. 318.

[59] Humphries, 'In search of the real cost of living'.

[60] King, 'Pauper inventories'.

I.V | Consumption needs

The last piece of the model concerns the family's consumption needs. For now, in order to illustrate how the model functions, the baseline family containing two adults and three children is employed. This family starts off comprising just the husband and wife, then grows to its peak size as children are born, and finally shrinks as adolescents leave home. When we broaden our perspective to include a range of family sizes and structures later in this article, the family reconstitution data of the Cambridge Group for the History of Population and Social Structure are called on to provide a more realistic guide to the historical evolution of the consumption needs of families of different types.[61] We do not include extended families in our modelling exercise, an omission justified by Laslett's demonstration of the dominance of nuclear families in the English past.[62]

In order to assess a family's total consumption expenditures, we use the 'respectability' consumption basket as proposed in work by Allen, which we also used in figure 1. [63] Allen's alternative standard, the 'bare-bones' basket, supports mere survival and could not sustain the physically demanding work undertaken by our household members, nor would it allow any surplus to cope with the exigencies occurring intermittently in a typical lifetime, such as those associated with childbearing (midwife, doctor, layette, and so on).[64] The respectability basket provides basic consumption goods: food of a specific caloric value, clothing, heating, and housing, all described in online appendix table S2 alongside the quantities purchased. Allen's basket aims to trace price change over time in a consistent way, although people might have chosen a different composition for their diets in reality. The prices of commodities, used to calculate the annual costs of the family's total consumption, are also taken from Allen's studies.[65] Adults are each assumed to consume a whole consumption basket, children just one-half, totalling 3.5 baskets for the family at its peak. When we consider the Cambridge Group's data demographic later, we perform a more careful analysis of children's consumption needs than the one used here, and on the basis of more realistic demography.

II | THE BASELINE ANALYSIS: LONG-RUN LIVING STANDARDS OVER THE FAMILY LIFE CYCLE, 1260–1850

We now track the welfare ratio of our baseline family during each of its six life-cycle stages, decade by decade, across our nearly six centuries of observation, 1260–1850.[66] Remember our baseline family enjoys such persistent good fortune that we judge its experience unlikely to have been completely representative. Nonetheless, its consideration serves two useful purposes: first, it tracks family welfare over the very long run, 1270–1850, and puts into perspective our more detailed discussion later of the period after 1560 when better demographic data are available; and second, it helps the reader to understand our methodological approach.

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[61] Wrigley et al., *Family reconstitution.*

[62] Laslett, 'History of the family'.

[63] Allen, 'High wage economy'.

[64] We discuss the effect of measuring welfare against the bare-bones basket instead later.

[65] Allen, *British industrial revolution*; idem, 'High wage economy'.

[66] Our analysis does not consider the living standards of lifelong-celibate men and women. Their welfare ratios are reported in Humphries and Weisdorf, 'Wages of women', and 'Unreal wages'.
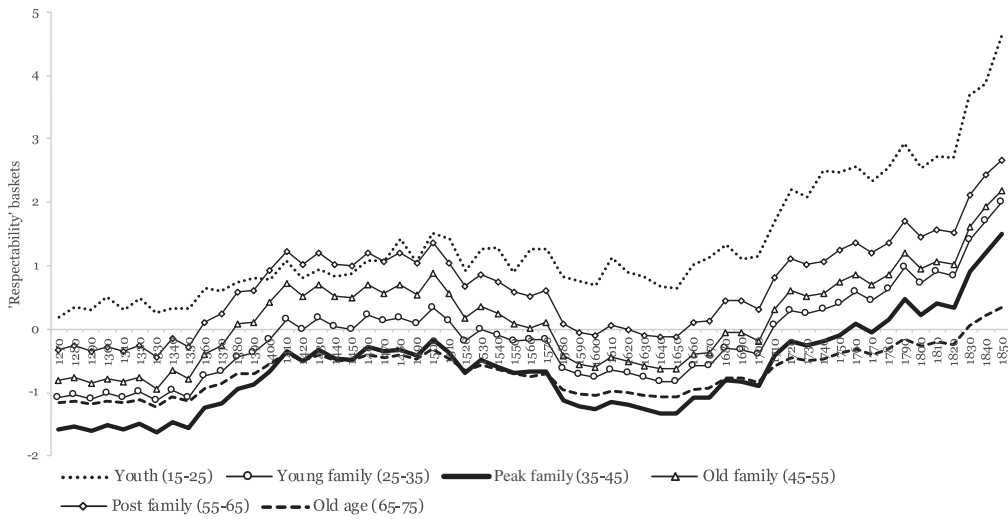
FIGURE 2 The household's real annual net surplus at each life-cycle stage, 1260–1850. Each year refers to a decade, so 1270 means the 1260s. The *net* surpluses (or deficits) are expressed in terms of the number of respectability baskets that the couple could afford *in addition* to the total household consumption in *each* year of the relevant decade. *Sources*: Wages: Humphries and Weisdorf, 'Wages of women', app. A1; eisdem, 'Unreal wages', tab. A2. Respectable costs of living: Allen, *British industrial revolution* (wage and consumption basket costs from https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages/)

We first explore the couples' *net surplus*, that is, the consumption potential of their earnings, measured in respectability baskets, after their families' needs have been met, in each life-cycle stage and decade. Then, we allow couples to smooth their consumption, that is, to carry a potential surplus over to the next life-cycle stage, which enables us to track accumulated family wealth decade by decade. If earnings are insufficient to cover respectability, since no borrowing is allowed, families must retreat towards a bare-bones standard, or raise the contributions from members persuading them to work longer and harder as discussed later, or have recourse to alms or poor relief. We approach this sequentially, although it is clear that the result of women not working or savings not being used for consumption would be to increase the amount of child labour required above the levels estimated later.

Figure 2 shows the couple's *net surplus* in each of the six life-cycle stages under investigation, from when they became independent at the age of 15 up until their death at the age of 75. Recall that the woman works full-time (that is, for an annual wage) during her *youth*, but moves into casual employment thereafter, when she works for a day rate either for 50 or 100 days per year depending on the life cycle, as specified earlier. The dotted line reports the number of respectability baskets that can be purchased by the net surplus during *youth* (ages 15–25). The dotted line is always positive, which means that mutual pre-marital income was more than enough to cover a respectable living for both independent adolescents and leave a surplus at all times.

The net surplus differs, however, from one end of our timescale to the other. The accumulated real value of a young couple's pre-marriage net surplus before the Black Death was roughly one-third of one respectability basket each year. The comparable number for a young couple at the other end of the period, around 1850, was almost five respectability baskets each year, some 15 times more than that of their thirteenth-century counterparts. Improved real net earnings came in two waves: one set in motion by the Black Death and lasting (with interruptions) for

one-and-a-half centuries (the so-called 'Golden Age of Labour'), and one beginning around 1650 and lasting for two centuries, that is, Humphries and Weisdorf's so-called *early-modern economic growth*. The latter was by far the more important.

The remaining trajectories trace the surplus after deducting the consumption needs of the whole family in each of the ensuing stages over the whole timespan. They follow roughly similar trends to the one relating to *youth*, but the levels differ substantially. Pre-Black Death couples all fell short of income *immediately* into their married life, and, despite their joint efforts, were unable thereafter in any life-cycle stage to produce a surplus or, indeed—in the absence of savings or child labour—reach a respectable living. The situation improved during the post-plague Golden Age. For example, fifteenth-century families were able to create a net surplus during all life-cycle stages, except for the *peak-family* stage (age 35–45) and *old age* (age 65–75), when a respectable living could not be assured without the help of past savings, charity, or current child labour. The sixteenth and seventeenth centuries saw setbacks, with all life-cycle stages except *youth* facing net deficits; but, with the turn of the century, each life-cycle stage began to see net surpluses again, although old-age poverty persisted until the 1830s.[67] However, we have not yet allowed for life-cycle savings, which alters the picture.[68]

II.I | Introducing savings

The numbers in figure 2 represent the *instantaneous* surpluses and deficits of our stylized family during its different life-cycle stages. What would happen to the family's standard of living, especially during episodes of poverty, if we allow previous periods' surpluses to be carried over to the next life-cycle stage? And, if there are still deficits, would child labour help the family stay afloat? Borrowing is not countenanced so remaining deficits in any period can only be met with additional labour inputs. Figures 3 and 4 offer answers to both questions, showing the couple's real accumulated wealth at the end of each life-cycle stage, expressed in terms of the number of respectability baskets that the wealth could purchase (figure 3), and the number of days of labour of each able-bodied child needed to keep the family's consumption at a respectable level (figure 4).

Figure 3 makes clear what figure 2 suggested, namely that the pre-Black Death period and the seventeenth century were hard times when child labour, charity, or, for the later periods, poor relief was needed. The introduction of savings improves the picture, especially when times were

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[67] We focus on a family engaged in rural activities. The increasingly urban nature of the economy after 1700 might yield a different trajectory for those living in larger towns or cities. We note that other recent work using the annual male wage series splices this to Feinstein's, 'Pessimism perpetuated', all-worker series from 1700, presumably to capture the shift in occupational structure; see Crafts and Mills, 'Race'. But we also note that Feinstein's series offers little optimism for living conditions during industrialization because of cost-of-living increases, and that the use of Allen's *constant* consumption bundle to map welfare ratios obscures Feinstein's more expensive costs of living. We return to the implications of this drift away from the respectability basket in our conclusion.

[68] Comparison with the bare-bones consumption basket would indicate a higher ratio of the survival budget realized at each point in time. The valuation of the bare-bones basket at about half that of the respectability basket would imply the couple able to maintain themselves and their family at –1 on the current y-axis measured in respectability baskets. It can be easily observed that only occasionally were families forced below this standard, prior to the Black Death and in Tudor times, both periods of recognized hardship and widespread claims on charity or poor relief, and then only in old age or when the family was at its peak size. This finding is consistent with the discussion earlier that highlights the impossibility of long-term family survival at bare-bones standards and with the historical observation of few periods of mass famine in England after the mid-fourteenth century. Comparison with bare-bones survival underlines the validity of the model of the family being used.
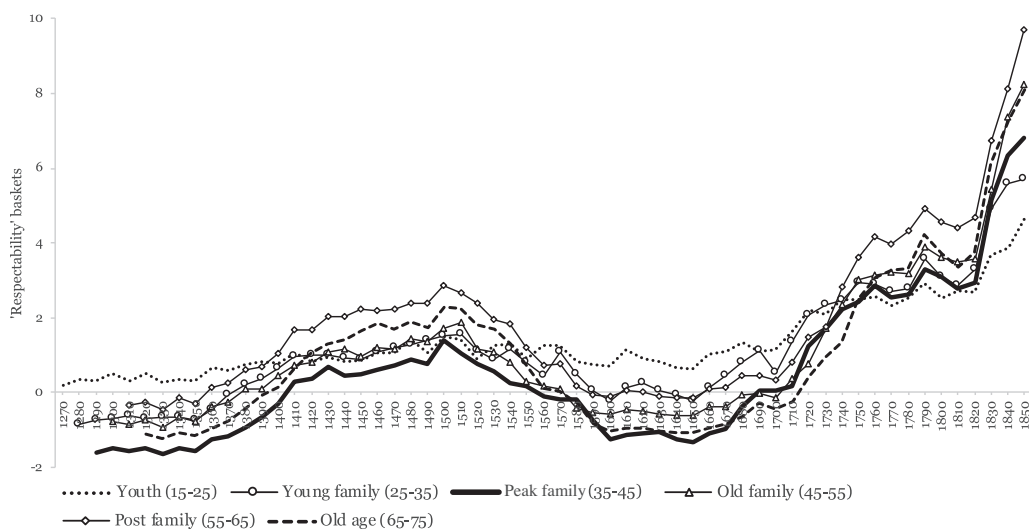
FIGURE 3 Real yearly accumulated wealth in each life-cycle stage, by decade, 1260–1850. Each year refers to a decade, so 1270 means the 1260s. The accumulated wealth (or deficits) are expressed in terms of the number of respectability baskets that the couple could afford *in addition* to the total household consumption in *each* year of the relevant decade. *Sources*: As for fig. 2
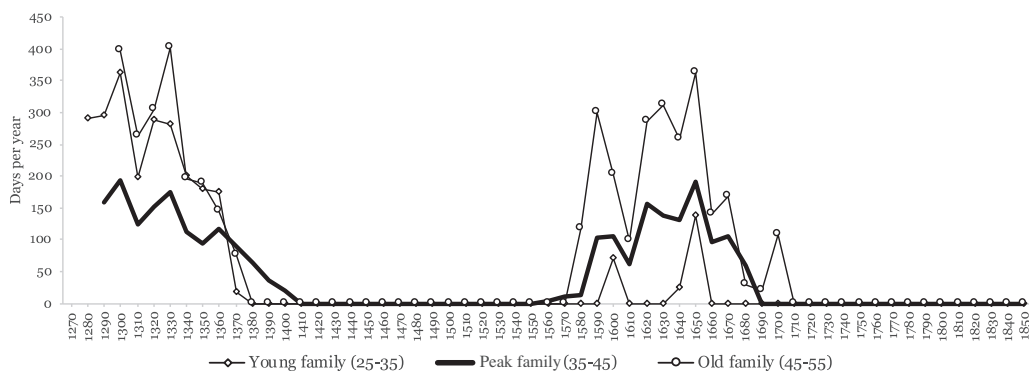

FIGURE 4 The implied number of days of labour of each working-age child, 1260–1800. Each year refers to a decade, so 1270 means the 1260s. The implied number of days are computed by dividing the life-cycle deficit of fig. 3 for each decade by the daily wage rates multiplied by number of resident children at working age. *Sources*: Wages: Humphries and Weisdorf, 'Wages of women', app. A1; eisdem, 'Unreal wages', tab. A2; Horrell and Humphries, 'Children's work and wages', app. A3. Respectable costs of living: Allen, *British industrial revolution* (wage and consumption basket costs from https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages/)

less hard. For example, savings mean that *all* stages of the life cycle now see surpluses in the centuries that followed the Black Death to 1550, and again after *c.* 1700 (compare figures 2 and 3). For these extended periods, and as long as the husband worked full-time and the wife part-time as specified, no child labour was required for families to enjoy a respectable living. However, before *c.* 1400 and between *c.* 1560 and 1670, either consumption fell short of what was necessary for decency, or child labour or charity was required, as we discuss later.

To provide context to these findings, we make comparison with some existing estimates. In the 1560s, our representative young couples were able jointly to amass some £22 over a decade, equivalent to slightly more than one consumption basket per year. This was certainly consistent with (though towards the high end of) the net worth in goods stated in witness depositions in Church courts, some £9–£35 for a male and a female servant taken together as reported in work by Shepard and Spicksley.[69] The total saved by a couple in service for a decade in the 1780s was £101 over a decade, close to two consumption baskets per year, so above the £27–£60 reported by Kussmaul for two young servants after 10 years of service but close to the amount needed, according to Arthur Young, to rent and stock a pastoral farm for a year.[70] Provision for old age can also be benchmarked. Analysis of labourers' probate inventories reveals total values of wealth at death of £15 in 1550–99, rising to £54 by 1700–1800,[71] consistent with our estimates of between £5 in *c*. 1700 and £56 in 1800.

II.II | Child labour

Given that other sources suggest that families under pressure also commonly pursued an 'added worker' strategy in which children were central,[72] we now estimate how much child labour would have been needed to maintain consumption at the respectable level. To this end, we use the daily wages reported by Horrell and Humphries for the relevant decades,[73] to ask how much each resident child of working age (five to 14 years) needed to work to avoid the family running into a deficit.

Figure 4 gives an answer. The graph shows that all resident children between the ages of five and 15 sometimes needed to work over 300 days annually before *c*. 1400 and again between *c*. 1550 and 1700. Fewer days were needed outside these periods of pressure. Golden-Age adult income may have over-ridden the long-held expectation and necessity for children to contribute to family welfare, although we cannot say whether children did in fact work less, labour shortage and many left parentless may have militated against this benign effect. Conversely, the Tudor period witnessed severe economic disruption and recession, necessitating child labour, but labour market restrictions probably reduced the opportunity for children to realize this contribution. Interestingly, during the *peak family* stage (the bold, solid line in figure 4) individual children were often not required to work for so many days as during the earlier or later stages of the family life cycle (the lines with markers). The explanation for this seeming anomaly is that more children were resident at home during the *peak-family* stage and could share the burden of work. Further, as long as savings were possible (figure 3) and parents were present and working and earning as prescribed above, child labour was *not* required for a respectable living during most of the fifteenth to sixteenth or eighteenth to nineteenth centuries. Remember, however, that these findings are conditional on the willingness and ability of children and both parents to provide the support assumed.

[69] Shepard and Spicksley, 'Worth, age, and social status', tab. 9, p. 517.

[70] Kussmaul, *Servants*, p. 81, tab. 5.3, p. 82; Wrigley et al., *Family reconstitution*, p. 124.

[71] Muldrew, *Industriousness*, p. 401.

[72] Horrell et al., 'Family standards of living'.

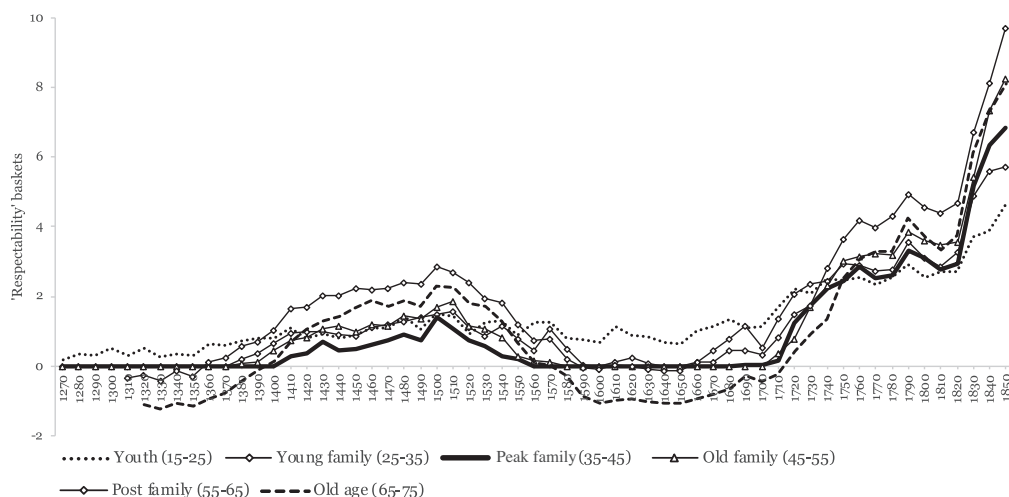[73] Horrell and Humphries, 'Children's work and wages'.

FIGURE 5 Real yearly accumulated wealth, by decade and child-labour adjusted, 1260–1850. Each year refers to a decade, so 1270 means the 1260s. The accumulated wealth (or deficits) are expressed in terms of the number of respectability baskets that the couple could afford *in addition* to the total household consumption in *each* year of the relevant decade. *Sources*: As for fig. 4

Conditionality also applies to our conclusion concerning the couple's accumulated wealth *after* adjusting for the child-labour contributions given in figure 4. Figure 5 suggests that, now, only one life-cycle stage remains subject to poverty: *old-age* (ages 65 to 75). Old-age poverty was also only the case before 1390 and during the seventeenth century. However, we reiterate that this was a fortunate and long-lived couple. In reality, a very high proportion of people suffered widowhood, often repeatedly if remarriage occurred.[74] We turn to this commonplace occurrence in the next section.

Even for this healthy, long-lived couple, in hard times old-age poverty was acute. During the punitive 50 years from 1600 to 1650, late in life couples were some £6 short of reaching a respectable living: they could only afford to buy, and so had to share, one respectability basket between the two of them. Without help from children or charity, many elderly couples during this period probably fell back to the drudgery of a bare-bones existence, or despite its stigma, meanness, and sometimes required residence in a dreaded poorhouse, were forced to resort to poor relief.[75] Even after a lifetime of prudence and economy, the elderly could not hope to live respectably. Though barely visible from the graph, during the seventeenth century the *post-family* years (aged 55 to 65) could also be times of hardship, but here it required little extra work from the wife (we have assumed two days per week on average for 50 weeks for this life-cycle stage) to earn enough to bridge the gap back to a respectable living. So, after adjusting for savings and child labour, old age was effectively the only time when this family, blessed as it was in terms of size, structure, and ability to find work, was severely tested.

Our picture of the living standards of ordinary families over the long run at various points in the life cycle highlights a key finding. As others have observed, once arbitrary assumptions about men's days of work in the year have been avoided, the Golden Age for medieval labour may not

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[74] Erickson, *Women and property*; Moring and Wall, *Widows*.

[75] Rowntree, *Poverty*; Thomson, 'Welfare of the elderly'; Lees, *Solidarities of strangers*; Thane, *Old age*.

have been quite so golden.[76] Only after the mid-seventeenth century do we find families enjoying more or less uninterrupted improvement, a finding consistent with the lower frequency and amplitude of downturns enabling sustained economic growth from the late seventeenth century onwards.[77] It is this longer-term improvement we now consider by introducing the realism of demographic structure and family circumstance.

In particular, the overall relatively optimistic findings, for the period after *c.* 1700 especially, hinge on two important and ahistorical assumptions: that families remained intact and that adult members behaved as assumed. Parents needed not only to survive through all stages of the family life cycle but also be willing and able to work at the rates suggested. There is no room in this analysis for parental morbidity or mortality; nor for absence, alcoholism, idleness, disability, un- or underemployment, or mere bad luck. Such an untroubled family life would have been extremely unusual in medieval and early modern England. Death frequently robbed children of a father's provision. However, mortality was merely one source of failing support for, even if yet living, fathers were sometimes unable or unwilling to shoulder the role of breadwinning: they fell ill or became injured, they enlisted in the army or were pressed into the navy, they were idle or drunken, or simply unable to find jobs. In extreme cases they absconded.[78] The next section captures the blight that these common crises cast on family well-being.

III | TOWARDS GREATER REALISM: FAMILY LIVING STANDARDS OVER THE LIFE CYCLE, 1560–1850

Contemporary accounts and numerous historical analyses demonstrate that the late eighteenth and early nineteenth centuries witnessed marked growth in child labour.[79] Similarly, the same decades saw poor law expenditures rise worryingly to form a considerable share of national income.[80] These developments do not chime with our relatively optimistic findings above. The reasons are obvious. They lie in the protection from the harsh realities of past life that our assumptions afford. Greater demographic realism and a broader perspective on family types is needed to capture the experiences of large, stressed, broken, and even just unlucky families and the effects of these common circumstances on family living standards, as emphasized in earlier work by Schneider.[81]

Our baseline model, introduced earlier, held family size constant at two adults and three children throughout time, clearly an unrealistic assumption given the population growth that preceded the industrial revolution. Indeed, family size not only increased, but varied widely at any given point in time—from no children at all to families of more than 10 children.[82] These differences in family-specific dependency ratios created large disparities in family standards of

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[76] Hatcher, 'Unreal wages'; idem, 'Seven centuries'; Appleby, *Famine*.

[77] Broadberry and Wallis, 'Growing'.

[78] Snell, *Labouring poor*; Kent, '"Gone for a soldier"'; Humphries, 'Female-headed households'; Bailey, *Unquiet lives*; Humphries, *Childhood and child labour*.

[79] Gaskell, *Manufacturing population*; Horrell and Humphries, '"Exploitation of little children"'; Galbi, 'Child labor'; Tuttle, *Hard at work*; Honeyman, *Child workers in England*; Humphries, *Childhood and child labour*; eadem, 'Child labour'.

[80] Broadberry, Campbell, Klein, Overton, and van Leeuwen, *British economic growth*, p. 327; Mitchell, *British historical statistics*, p. 410; King, *Poverty and welfare*; Lindert, 'Poor relief'; Goose, 'Elderly poor'.

[81] Schneider, 'Real wages and the family'.

[82] Wrigley et al., *Family reconstitution*.

living not accounted for in the baseline model. The baseline model also assumed that mothers and particularly fathers, who provided the lion's share of family income, were present and willing and able to work and earn throughout the family life cycle. In historical reality, families did not remain intact. Mothers and fathers died or disappeared, and even if they remained resident were not always competent or willing contributors to family income. In short, family structure and functioning varied around the robust performance of the baseline case also creating large disparities in living standards.

More realistic demographics are introduced into the life-cycle model using the Cambridge Group's family reconstitution data.[83] We consider how family size and numbers of dependent and working-age children evolved, exploring these empirically based demographic trends in combination with less idealized and more realistically fragile family structures. Specifically, we explore three possible historical scenarios, in each case combining the more grounded demographics with a distinct and historically common family type. The first tracks a family that like our fortunate baseline case remained intact with the wife and husband able to earn as assumed but with dependency rates following those observed historically. The second considers a less fortunate family in which the husband/father does not contribute to family income either because he could not find employment or because he was unable or unwilling to work. The third focuses on a family where the husband/father is missing either because he has died or because he has abandoned his children and their mother after the marriage. These scenarios capture the varied and often dismal experiences of labouring families in early modern England.[84]

The pioneering work of the Cambridge Group has reconstructed historical families in England, 1541–1871.[85] We use the family reconstitution dataset as the basis for our analysis of family demography. We reconstructed the original dataset to reflect our interest in working-class families headed by unskilled men. First, we restricted this subsample with regard to socio-economic class. We selected families where the father's occupation was known, which was almost always the case in data from marriage and birth registers, and then, using the standardized occupational classification system, HISCO/HISCLASS,[86] extracted fathers whose occupations were unskilled (HISCLASS 11 and 12).[87] This left us with 9,387 unskilled working-class families.

In the first family scenario described above, both parents were able to provide the support assumed in the baseline case of the previous section. For this scenario, we selected a subset of the family reconstitution data containing only 'completed' marriages, that is, where the wife and husband both survive until the end of the family life cycles, ensuring that fertility was not interrupted by mortality. We excluded the first two decades of the data subset, 1540–59, because they contained only one and five families of this kind respectively. The remaining decades had information for well over 30 families on average, aggregating to 1,584 sampled families with 'completed'

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[83] Ibid.

[84] While we do not claim to make any causal statements concerning family size and scenario outcome, we realize the endogeneity issue arising from the fact that very large intact families might cause the husband to leave or become unable to work (for example, because he becomes alcoholic given the circumstances). We also do not consider the possibility of remarrying if the husband dies, as this would essentially shift the family's welfare trajectory from scenario 3 back to scenario 1.

[85] Wrigley et al., *Family reconstitution*, data available at UK Data Archive, doi.org/10.5255/UKDA-SN-853082.

[86] van Leeuwen and Maas, *HISCLASS*.

[87] Church authorities were obliged to record a male occupation on the occasion of a wedding or a child baptism. Men therefore always gave an occupational title, even if they were un- or underemployed. The CAMPOP data hardly ever contain the occupational descriptor 'unemployed'.

marriages. We use the same subset of data in our second scenario, but here our family type is defined by a husband who while remaining resident within the family was unable or unwilling to work, decimating family earnings and forcing his wife to labour full-time.

Our final scenario introduces a third family type, one eventually headed by a woman, whether a widow with orphaned children or a family abandoned by the husband/father. In this scenario, we assume the husband dies or disappears at the age of 35 in the midst of raising a family. Here, family births follow the pattern in the subsample specified earlier, but come to a halt after the husband vanishes. We assume that the wife lives on to the age of 75, meaning that she and the children born before the husband died or disappeared had to support themselves from the *peak-family* cycle onwards. As with the previous scenario featuring a still present but failing breadwinner, the lack of adult male support dramatically reduces family earnings and forces the mother to work full-time. However, in this final case as the husband is no longer present he neither eats nor procreates, which limits the damage imposed on the family budget compared with the second scenario.

To inject greater breadth, we also computed the standard deviations of family size from the sampled reconstitutions and used these to predict the range of experience in each of the three scenarios above. An average 'completed' family in the sub-sampled data gave birth to somewhere between two and four children, so close to the baseline family of three children assumed by Allen, and portrayed earlier.[88] However, as online appendix figure S3 shows, large families (the mean plus 1.96 times the standard deviation) ranged between five and 11 births during the three life cycles covered by the model. The smallest families during the period of observation contained no children. The standard deviation in family size enables us to calculate and graph the 95 per cent confidence intervals for the various measures of family living standards originally displayed earlier in figures 2–5, but this time with more accurate demography and family structures.

III.I | Representativeness

We should consider how many English families are covered by our analysis, that is, were working-class and either intact or disrupted. While it is difficult to get a precise estimate, we can get a rough idea from the overall composition of English families by social rank and information about family types contained in the family reconstitution dataset and other sources. Based on sources for the general population, Boberg-Fazlic et al.[89] suggested that labouring families represented almost half of all English families at this time. Meanwhile, Allen's recent reworking of the social tables of King, Massie, and Colquhoun finds that this is an underestimate.[90] Families in his consistently coded 'Workers' category (conservatively excluding both cottagers and paupers below and lower middle class above) make up 56 per cent of all families in 1688, 56 per cent in 1759, and 61 per cent in 1798.

It is even more difficult to identify the proportions within this total represented by the different family types, but again we can offer some orders of magnitude. The Cambridge Group's data indicate that some 40 per cent of all husbands died before completing the family life cycle, that

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[88] Allen, 'High wage economy'.

[89] Boberg-Fazlic et al., 'Survival of the richest?'.

[90] Allen, 'Class structure'.

is, before the husband reached 55 years of age (see online appendix figure S2).[91] Many of these men died after their children were grown but simulations of orphanage using CAMSIM[92] suggest that some 16 per cent of working-class children lost their fathers before they reached the age of 14, and around the same proportion of working men and women who provided autobiographical evidence reported the deaths of fathers during their childhoods.[93] Moreover, as explained above, families were deprived of adult male support for reasons other than death. The autobiographical evidence suggests that in a similar proportion of working families, fathers while yet living had disappeared or were resident but inadequate breadwinners.[94] Altogether, then, about a third of working families and almost 20 per cent of all families were of type 2 or 3 and fell short of the robust structure of our baseline case.

III.II | A family example

Online appendix table S2 gives an example based on a marriage between Hannah (maiden name Simes) and John North drawn from the Cambridge Group's data.[95] The family example is used to illustrate the variables available from the family reconstitution dataset and to explain how we exploited them in the analysis below. Hannah and John's marriage took place in Odiham, an ancient market town in Hampshire, in 1804. Hannah gave birth to a total of seven children (the average of the sampled families at the time): Elizabeth in 1805, Jane in 1807, Anne in 1808, Martha in 1810, George in 1813, Louisa in 1816, and finally John in 1821. The records show that daughter Jane died within a year of birth, daughter Martha died aged 18, and daughter Anne aged 30. The remaining offspring have no reported date of burial, either because they moved after leaving home to a parish beyond the family reconstitution catchment area or because they died outside the period of observation. For our purposes, however, it is important only that Jane did not survive beyond the age of 15.

Information of this kind enables us to predict the numbers of resident and working-aged children during the three life cycles of the family described in the previous sections. In turn, this allows us to refine the analysis by computing families' total calorie requirements and thus the income needed to purchase a sharper nutritional measure of respectability. In the North family's first stage (the *young-family* cycle), the number of resident children grew from zero to four, but only one of the four children reached working age (online appendix table S3). During the second family stage (*peak family*), the number of North children grew to five from which up to four reached working age. Finally, during the third family phase (the *old family*), the number of resident children fell to one, as did the number of children of working age.

With this knowledge, we can compute the caloric requirements of each family member and aggregate to total caloric needs during each of the three family life-cycle phases. To this end, we used the caloric requirements by age specified by the FAO and reported in online appendix table

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[91] Mothers died at a slightly higher rate, again presumably spread over the family life cycle. We have not considered motherless families as a distinct type as they were either more likely to be absorbed into other households or to be reinvented via remarriage and so represented by a modified version of the intact scenario-1 family. Alternatively, orphaned children would be placed in institutions and so positioned outside the family structure we analyse here.

[92] Smith and Oeppen, 'Estimating numbers'.

[93] Humphries, *Childhood and child labour*; eadem, 'Girls and their families'.

[94] Humphries, *Childhood and child labour*.

[95] Cambridge Group's Family Reconstitution Data (Wrigley et al., *Family reconstitution*) FRF no. 2005.

S4.[96] According to the FAO, a one-year-old child needs 30 per cent of the calories of an adult. Since, following Allen, we provide adults with 2 500 calories per day,[97] this means a one-year-old should get 750 calories per day; a two-year-old 900 calories per day; a three-year-old 975 calories per day; and so forth until the child turns 15 whereupon he or she reaches the adult standard of 2,500 calories per day (see online appendix table S4). An infant is assumed to require 323 calories per day, based on needs during pregnancy and breastfeeding.[98]

Online appendix table S3 shows how the total caloric needs of the North family grew, from 5 000 calories per day for the husband and wife to nearly twice as many—9 375 calories—at the end of the *young-family* life-cycle phase. Dividing 9 375 by 2 500, this means that during the first 10 years of marriage the family's consumption-basket requirement increased from 2 to 3.8 full baskets. That number increased further during the *peak-family* stage, when up to 13 600 calories were needed each day to keep the North family at a respectable living standard, corresponding to 5.4 consumption baskets in total. The caloric needs and number of baskets then gradually declined as the family moved towards the final phase as an *old family*, ending at 2.8 baskets 30 years after Hannah and John's marriage. Online appendix figure S4 shows how the predicted contributions to family income from the various family members would have evolved year by year through the couple's life cycles in order to comply with their caloric needs.

III.III | The full-sample analysis

Following the North family example, we can now compute the annual incomes needed to buy the baskets required by the families found within the 95 per cent confidence interval of family fertility (online appendix figure S3) and then compare this with the household income that the couple was able to obtain under the assumptions described previously. Figure 6, panels A1–A3, shows the resulting real annual net surpluses, measured in respectability baskets, left at the end of the *peak-family* cycle after the family's respectable consumption needs have been covered, decade by decade between the 1560s and the 1840s. The bold line in panel A1 is comparable to the bold, grey line in figure 2, the only difference being that panel A1 uses actual fertility numbers. Because the actual fertility rates for an average family size are close to those assumed earlier—three children per family—the resulting family surpluses are not far from those reported in figure 2.

A key difference, however, is that we can now consider families that deviated from the archetypical one used earlier and by other authors in earlier studies. For example, it is clear that the smallest families—those with no children, as captured by the upper-bound line in panel A1—enjoyed significantly larger surpluses or smaller deficits than an average-sized family (the bold line) and fared much better than the very large families (the lower-bound line). The smallest families were between two and four accumulated respectability baskets better off compared to the largest

[96] FAO, 'Human energy requirements'.

[97] Allen, 'High wage economy'.

[98] Energy costs of pregnancy in women, according to FAO, 'Human energy requirements', is 69 calories per day in the first trimester; 266 calories in the second; and 496 calories in the third. The first trimester is assumed to be 79 days long, and the second and third 93 days long each, so the total additional caloric need of a pregnant woman is 73 527 calories. As for breastfeeding, a normal woman should increase her food intake by 121 calories per day, totalling 44 165 calories for a whole year if we assume she continues to breastfeed for 12 months. If we spread those 73 806 + 44 165 = 117 692 calories out on the first year of birth, then this corresponds to 323 extra calories per day, which thus accounts both for the pregnancy and the breastfeeding period during the child's first year of life.
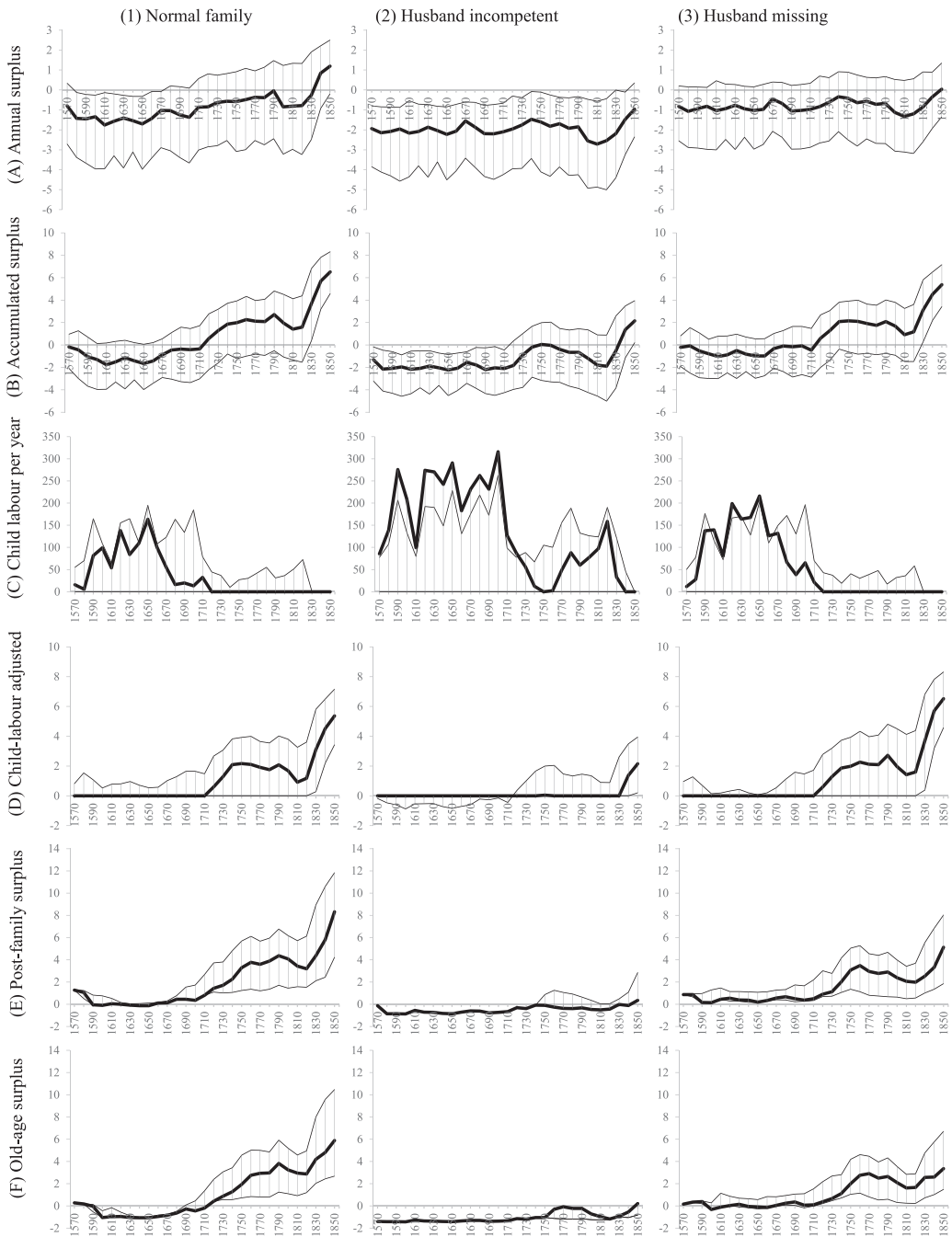
FIGURE 6 Surplus respectability baskets and child labour during the *peak-family*, *post-family*, and *old-age* life cycles, 1560s–1840s. Family welfare ratio on y-axes, except child labour per year where the y-axis represents days of work required. *Sources:* Wages: Humphries and Weisdorf, 'Wages of women'; eisdem, 'Unreal wages'; Horrell and Humphries, 'Children's work and wages'. Respectable costs of living: Allen, *British industrial revolution* (wage and consumption basket costs from https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages/). Demographic data: Wrigley et al., *Family reconstitution*

families (the lower-bound line in panel A1). Larger families, unsurprisingly, if they relied on the parents' earnings alone, were often in deficit to the tune of three to four respectability baskets.

Roughly similar differences during the *peak-family* stage in the cycle also applied to the less fortunate families (panels A2 and A3). However, these families differed in other important regards. Panel A2 shows the real annual surpluses in terms of respectability baskets when the husband was present but unable to generate income (our second family type). While large families were much worse off than smaller ones, none of the families short of the husband's contribution were capable of meeting a respectable standard (except those with no children at the very end of the period). For families where the husband died or went missing after the *young-family* cycle (panel A3 capturing our third family type), the *peak-family* stage was slightly more comfortable than when the husband was present but inactive. Still, with the exception of families with no or fewer than average children, meeting the respectable target was impossible without savings or contributions from children.

Saving did matter. For intact families headed by competent men (B1) and for families where the husband had died or disappeared (B3), saving alone meant that the average-sized family (bold line) was within touching distance of respectability before 1700 and certainly thereafter. Only the largest families struggled to meet the goal of respectability all the way up until 1830. However, families headed by incompetent breadwinners (B2), with the exception of the smallest ones after 1710, could not obtain respectability even after adjusting for pre-marital savings. A clear picture is emerging to suggest that very large families, alongside families with husbands unable or unwilling to work full-time year-round, strained to reach a decent standard of living even after 1800. Families in more favourable circumstances reached these standards about 1700.

The desperation of the struggling families reappears in the form of their reliance on child labour (panels C1–C3). As in the comparable figure 4, child-labour inputs declined across the board as the seventeenth turned into the eighteenth century. Yet panel C2 shows that pre-1700 the need for child labour was much greater if fathers were unable or unwilling to earn at the rates assumed, often twice as large as those headed by competent male breadwinners (C1) or where the husband was missing (C3). The post-1700 patterns of child-labour requirements are equally interesting. Families of incapable men saw a strong recurrence of child-labour needs in the latter half of the eighteenth century and early parts of the nineteenth, contributing to the spikes in child labour observed in the numerous historical analyses cited earlier.

It was not just among the less fortunate families that nineteenth-century children had to labour. Large families, even if intact and with competent male heads (the upper-bound line in panel C1), also had to send all able-bodied children to work for up to 60 days each year to earn enough for respectability. The growing use of child labour during the latter half of the eighteenth and early part of the nineteenth century is thus partly rooted in swelling family sizes, especially at the top end of the distribution. For while births within average-sized families increased by one child on average between 1760 and 1820 (online appendix figure S3), within families whose size was the average plus 1.96 times the standard deviation, almost two-and-a-half additional children were born during the same period. In these large families it is unsurprising that additional babies were not always whole-heartedly welcomed. Child labour, at least for the children, was also a contrast to the rising material living standards that increasing wages in this period created.

The historical record suggests—consistent with our model's predictions—that it was orphaned, fatherless, or *de facto* fatherless children who were in the vanguard of the child labour force.[99] However, our analysis suggests that the child workforce also included children from seemingly

[99] Honeyman, *Child workers in England*; Humphries, 'Child labour'.

adequately-resourced two-parent families when family size was large. Indeed, many children were observed labouring alongside relatively well-remunerated mothers and fathers, for instance, in coal mines and cotton factories, tempted in these cases by high wages and rationalized by social norms.[100]

The child-labour-adjusted accumulated surpluses, reported during the *peak-family* life-cycle stages in panels D1–D3, show that intact families alongside families with missing husbands were able, when assisted by their children's labour inputs, to reach a respectable standard of living regardless of their family size. Here, it is important to recognize that large families have larger supplies of child labour, explaining why they are not additionally set back compared to their smaller counterparts. Equally, it is worth noting that families with missing husbands/fathers are roughly on a par with or even sometimes better off than standard families (compare D1 to D3) since a lost father neither sired additional children nor consumed family resources. Families of incapable husbands (D2) fared significantly worse than the other two family types. Paradoxically, in this group childless couples and very small families were worse off than their larger counterparts where older children could help mothers support both fathers and younger siblings.

We close by considering living standards beyond the three child-rearing cycles, checking to see if and when poor relief was needed later in life among the three family types. Intact families alongside families where the husband went missing, leaving only the wife, enjoyed considerable improvement in their living standards after the turn of the eighteenth century. This is captured by panels E1 and E3 showing the *post-family* life-cycle stage, as well as panels F1 and F3 showing *old age*. These gains were enjoyed by small, average, and large families, all of which witnessed substantial growth in their surplus in their last two stages of the family life cycle. However, family size left indelible footprints on *post-family* living standards. Small families (the upper-bound lines) were able to amass greater surpluses later in life compared to their larger counterparts (the lower-bound lines), helped by larger carry-over surpluses from previous life cycles. The graphs also indicate the relevance of the poor law for the families of frail breadwinners (panels E2 and F2). Very small families of this type with few or no children (the upper-bound line in panel E2) could barely attain respectability during the latter half of the eighteenth century and the first half of the nineteenth. Larger families, both during the *post-family* phase and even more so during *old age*, would have struggled to make ends meet, especially in the first parts of the nineteenth century.

How much poor relief would those needs translate into? For example, couples over 65 years of age with an incapacitated husband lacked about 1.25 consumption baskets per year (panel F2). How much charity would it take to cover this gap? An approximate answer to this question suggests £341 438 in 1801.[101] Perhaps more interesting, our study assumed that each and every child in broken families was able to find around 100 days of work per year (panel C2). What if they could only find half as much? If child-raising families made up half of the total population and each of the families in need required an additional 1.8 baskets beyond that earned by the two parents on average (panel B2), children's work would cover the cost of half these baskets, but £2.049 million

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[100] Horrell and Humphries, 'Breadwinner family'.

[101] The population of England and Wales was 8 671 439 in 1801 and 8% were aged 60 and over; Wrigley et al., *Family reconstitution*, app. 9, p. 614. We assume 6% were aged 65 and over. Earlier we have cited 'Workers' as 61% of household in 1798 (Allen, 'Class structure') and labourers at around half the population (Boberg-Fazlic et al., 'Survival of the richest?'); taking the lower estimate we now assume 30% of these were elderly in need of relief, requiring 1.25 baskets at a cost of £7 per annum yields £341 438.

would be required from poor relief to cover the other half.[102] On our estimates £2.39 million in poor relief would be needed by the families we have studied here. This compares sensibly with the £4 million that was spent on poor relief in total in England and Wales in 1801, when other claims, such as the under- and unemployed adults, orphans, and the disabled are also included.[103] Future studies are needed to shed light on this matter for earlier periods.

On a final note, the evolution in standards of living shown in figure 6 bears witness to a changing society with potential implications for family planning decisions. Before 1700 and where poor relief was not forthcoming, couples would have had to rely on transfers from their grown children in order to avoid old-age poverty, something undiscussed in the model presented earlier. In principle, this would have required children not only to work at young ages to help support the family, but also to help sustain their parents later in life. In practice, the poor law and negotiated transfers may have muted this effect.[104] But the necessity for dependence on inter-family transfers clearly changed around 1700, when parents were able to support themselves and could even transfer money to their children. As the model shows, parents then fared better in terms of surpluses across their life-cycle stages (and certainly during old age) the fewer their offspring. At the same time, men and women who had grown up in large families, where they had experienced competition for resources and pressure to work at younger ages, perhaps came to favour fewer children.[105] These experiences may have helped to motivate the transition towards lower fertility later in the nineteenth century as well as explain how resources became increasingly available for investment in the next generation's human capital.

In sum, the qualitative conclusions drawn for the baseline case—that an intact working-class family of average size was able to secure a respectable living from the eighteenth century on without the use of child labour and poor relief—are robust to using more empirically based demography. However, men and women who were unlucky, imprudent, or particularly fertile ran the risk of heading large or fractured families with much less benign outcomes. Their circumstances help understand the expansion of child labour and recourse to poor law support during industrialization.

IV | CONCLUSION

This article has presented the first study of family living standards across the life cycle and including families of different sizes and structures for pre-modern England. Mainstream studies have usually, implicitly or explicitly, assumed a male breadwinner model with the husband/father as the sole source of earnings reckoned according to casual wage rates, but always assuming 'full-time' (that is, 250 days per year) employment at all ages and over the complete family life-cycle. While paying lip service to the need to include other family members' contributions, standard accounts have ignored or treated as marginal the earnings of women and children and their implications for living standards. Abandoning doubtful assumptions and limited perspectives, we have

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[102] Following the same logic as above, half of the 8 671 439 population were in child-raising families, one half of these were labourers, and one-third were in need. This gives 325 179 families requiring 0.9 baskets at £7 per annum, a total of £2.05 million.

[103] Lindert, 'Poor relief', p. 113, finds relief expenditure was 2.15% of GDP in England in 1801–3. GDP for Great Britain (including Scotland) was £232 million in 1801; Deane and Cole, *British economic growth*, tab. 37.

[104] van Zanden, Carmichael, and de Moor, *Capital women*.

[105] Humphries, 'Children, mothers, and fertility decline'.

turned the standard of living question on its head. We have asked not what an imaginary family was able to achieve on the basis of male day wages, but whether, with representative wages and historically informed estimates of the labour inputs of women and sometimes children, families could attain respectable standards at different stages in the family life cycle and different points in English history. Shortfalls are then associated with the need for families to reach beyond their adult members and call on children to contribute or appeal to charity or poor relief.

In essence, our framework endogenized the labour supply of children and then observed how labour inputs varied over time and across the family life cycle. We concluded that some stages saw family surpluses, which could be used either to increase leisure or to improve living standards. Other periods were more testing and these demanded full-time work from all resident children of working age. Our model's identification of the period before the Black Death and the late 1500s and early 1600s as times of severe pressure is consistent with other studies of poverty and hardship.[106] Our original investigation of the varying pressures on families over the life cycle also identified key phases of particular stress: the *peak-family* stage and *old age*. The miseries faced by the elderly emerge as a historical constant, consistent with their dominance among the clientele in historical studies of charity and poor relief.[107]

While much can be learned from our baseline case, we emphasized that it traces a rarefied experience, protected from the hazards of parental frailty, demographic remorselessness, macroeconomic volatility, international political turbulence, and mere bad luck. Fortunately, for the period after 1560, better demographic data enabled us to address some of these limitations and take significant steps towards greater realism. We identified three historically common family types representing less providential experiences: families with many children; families whose husbands/fathers were unable or unwilling to work at the intensity assumed; and families whose husbands/fathers had died or disappeared. Following such families through their life cycles, and over time, explains much about the persistence of poverty, indeed its intensification in particular circumstances.

By placing the family with its various members rather than just the husband at the centre of the story, we have shone new light on family strategies and circumstances. However, our research demands a new focus on several further questions. First, our approach is *supply-side*. We trace the labour that family members *needed* to supply at the going wage rates to achieve a collective target, the cost of a family respectability basket of goods, leaving to one side the question of whether this labour would find a buyer. Yet the unreliability of demand, and the miseries created by under- and unemployment, have always been key elements in the standard-of-living debate, challenging any account of incomes based on grossed up day rates.

Insufficient demand was also an important factor affecting the waged labour available to married women at different points in time.[108] Agricultural work was seasonal while the mechanization of domestic manufacturing, particularly hand spinning, was a major blow.[109] On the other hand, the use of machinery and the factory system increased demand for child labour, a demand-side counterpart to the nineteenth-century boom in children's work that our framework helps explain. Indeed, regional differences in the demand for child labour may have encouraged the

[106] Dyer, 'Poverty and its relief'; Appleby, *Famine*.

[107] Rowntree, *Poverty*; Thomson, 'Welfare of the elderly'; Lees, *Solidarities of strangers*.

[108] Boyer, *English poor laws*; Burnette, 'Laborers at the Oakes'; eadem, 'Female day-labourers'.

[109] Muldrew, '"Ancient distaff"'; Humphries and Schneider, 'Spinning the industrial revolution'.

vast growth of population from in-migration experienced in England's industrial regions.[110] Further research is needed on whether under- and unemployment prevented families from reaching the material standards that we have shown were otherwise possible and whether geographical mobility was a response to labour market conditions.

The reverse of under- and unemployment is a booming labour market and heightened *industriousness*. Economic growth from the mid-seventeenth century introduced novel goods and new standards—tea, sugar, coffee, tobacco, china, cotton clothing, and domestic comforts, such as feather mattresses, quilts, curtains, mirrors, and lamps—the 'consumer revolution'.[111] These goods became the necessities of the day and few would have felt satisfied with the diet and comforts offered by the goods contained in online appendix table S2. Acceptable standards drifted further and further away from the contents of the respectability basket. The chronology of this divergence and its role in family labour supply and the evolution of living standards emerges as another pressing topic for economic historians' attention.

Finally, and perhaps most importantly, our demonstration of the importance of family size and structure to levels of well-being illustrates the fallacies involved in easy assumptions about the historical constancy of male breadwinners and robust families, and how they can mislead, and it surely gives new urgency to the investigation of how families changed over time and place. We need to know with much more certainty what proportions of families were of a size and type that exposed their members to privation and how this distribution changed over time. Only then can the standard-of-living debate pan out from its male centre to a more inclusive frame.

ACKNOWLEDGEMENTS

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[110] Shaw-Taylor and Wrigley, 'Occupational structure'.

[111] de Vries, *Industrious revolution*; Lemire, *Fashion's favourite*; Muldrew, *Industriousness*.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's website:

S1. Supplementary information as described in the text

How to cite this article: Horrell, S., Humphries, J., and Weisdorf, J., 'Beyond the male breadwinner: Life-cycle living standards of intact and disrupted English working families, 1260–1850', *The Economic History Review*, 00 (2021), pp. 1–31.
https://doi.org/10.1111/ehr.13105