

**The Sibsize Revolution and Social Disparities in
Children's Family Contexts in the United States, 1940-2012**

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Abstract

This paper points to a decline in children's sibling numbers ('sibsize') that occurred in the United States since the 1970s and was large enough among lower SES children (particularly black children) to transform their family circumstances. It interprets sibsize decline as a source of social convergence in children's family contexts that ran counter to trends towards social divergence caused by the rise of lone parenthood. The paper is based on new estimates of differentials in children's sibsize and lone parenthood by race and maternal education generated from public-use samples from the Census of Population and Current Population Survey, focusing especially on the period 1940-2012. The paper discusses some methodological and substantive challenges for existing scholarship arising from the findings and points to questions for future research.

Introduction

This paper examines the large and hitherto little noted decline in children's sibsize that occurred in the United States in the latter half of the twentieth century, particularly in the 1970s and 1980s (the term sibsize is used here to refer to the number of siblings in the child's sibling group, where an only child is counted as having a sibsize of one). It highlights the particularly large sibsize decline which occurred among lower SES (especially black) children – for example, in that the proportion of black 8-9 year olds with sibsizes of five or more fell from 56% in 1970 to 17% in 1990, compared to a corresponding decline from 30% to 8% among white 8-9 year olds (Figure 4 below). The paper interprets this decline as a positive but largely unnoticed counterbalance to what is widely viewed as a dominant trend – the 'diverging destinies' in children's life chances caused by widening social disparities in mother-headed families and related labour market problems for poor parents (McLanahan 2004, McLanahan and Jacobson 2015). The paper is based on micro-data from the US Census of Population (up to 1990) and the Current Population Survey (since 1990), from which it produces new estimates of differentials in children's sibsize and family structure by race and maternal education, referring especially to the period 1940 to 2012. The findings raise questions about current scholarly understanding of how family change has affected social inequalities in children's family contexts in the United States in the late twentieth century. The paper discusses some of these challenges and points to directions for future research.

The paper is organised in five parts. First it sets the context by looking at the evolution of research on fertility differentials in the United States and the shift of interest in recent decades towards family structure as a source of social differentiation in children's family contexts. That is followed by a methodological account of one reason for the neglect of sibsize – the often unnoticed difference between children's and adults' perspective on

family size (Preston 1976). The next section presents new estimates of social disparities in children's sibsize and family structure for the period 1940-2012, referring both to race and maternal education as axes of differentiation. A fourth section outlines some questions for future research and a final section concludes.

Family size and social inequalities: changing perspectives

Social differentials in family size were a major topic of social research in the first half of the twentieth century. The advent of long-term fertility decline in western countries in the late 1800s caused families to become smaller on average but also opened a gap between the large lower class family on the one hand and newly shrinking middle and upper class families on the other. The seminal empirical study of this topic was T.H.C. Stevenson's examination of growing social class differentials in fertility in England and Wales among marriage cohorts of women from the 1850s to the 1890s (Stevenson 1920). His analysis confirmed what many contemporaries had long suspected, namely that, as Stevenson put it, the 'more successful and prosperous classes were behindhand in their contribution to the upkeep of the nation' (Stevenson 1920: 417).

Stevenson's study emerged from a wave of research on fertility differentials at the time (see the citations in Pearl 1927; later examples include Ogburn and Tibbetts 1929, Edin and Hutchinson 1935, Methorst 1935, Notestein 1936, Westoff 1954; recent work includes Haines 1979, Szreter 1996, Barnes and Guinnane 2012, Dribe et al. 2014a, 2014b). These studies fed into debate on what was seen as the two-sided population problem of the inter-war years – the threat of declining population numbers caused by the overall fall in fertility and of worsening population quality caused by persistence of higher fertility among the poor and ethnic minorities (Ramsden 2003, van Bavel 2010). For eugenicists in the social Darwinist tradition, this double problem amounted to a paradox of the 'survival of the unfittest' and led to dire predictions about the degenerative

effect on populations of high fertility among the lower orders (Kevles 1985, Soloway 1990, Ramsden 2003). Less alarmist responses emerged in the social sciences, where hopes of raising population totals and improving population quality were pinned on social policies to encourage higher fertility among the better off and promotion of birth control among the poor and ethnic minorities (Ramsden 2009).

A key figure in the latter approach was Gunnar Myrdal, the Swedish social scientist who in 1937 was invited by the Carnegie Corporation of New York to carry out a study of the 'Negro problem' in the United States. The Swedish model of 'reform eugenics', which emphasised medical, educational and housing services for families with children and contraceptive services to limit fertility among the poor, appealed to liberal reformers in the United States and conferred a special status on Myrdal as an architect of the Swedish approach (Ramsden 2003, Broberg and Tydén 2005: 96-107). Myrdal's study of race in the United States which emerged from the Carnegie Corporation's commission, *The American Dilemma: the Negro Problem and Modern Democracy* (1944), echoed the agenda of reform eugenics in its view of black subordination as the result of social rather than genetic factors and its advocacy of a range of social and political reforms to advance the black cause. His analysis of the black family pointed to large family size as a key source of black poverty and led him to advocate birth control programmes for poor families as a core element of the solution (Myrdal 1944/1962: 157-180).

Myrdal's study inspired much subsequent analysis of black social disadvantage, including the landmark Moynihan Report of 1965, as Geary (2011) shows (Moynihan 1965/1967; see also Geary 2016). However, in his account of the black family, Moynihan introduced a change of focus by turning away from Myrdal's concern with family size and pointing instead to the role of a rising incidence of mother-headed families in the mechanics of black social disadvantage (Geary 2011 describes this perspective and

outlines how Moynihan became immersed in it from 1964 onwards; see also Geary 2016).¹ Moynihan spoke of family disruption in the black population in injudicious language, provocatively labelling the black matriarchal family as ‘pathological’ and appearing to criticise black men for their shortcomings as fathers, an approach that was soon excoriated as ‘blaming the victim’ (Ryan 1971/1976). The ensuing condemnation from white liberals and black leaders drove Moynihan’s analysis off the stage for a time (Massey and Sampson 2009, Patterson 2010) but it was rehabilitated in the 1980s, especially by way of William Julius Wilson’s classic study of urban poverty and marginalisation, *The Truly Disadvantaged* (1987). Wilson placed class rather than race at the forefront of analysis and avoided the graphic language that Moynihan had used. But otherwise he agreed that a proliferation of mother-only families was a key consequence of the limited job opportunities and neighbourhood segregation faced by America’s urban poor, whether black or white, and was a key mechanism by which social disadvantage among poor parents was reproduced among their children (Wilson 1987: 63-92).

Some other studies of the period, most notably Judith Blake’s *Family Size and Achievement* (Blake 1989; see also Blake 1985), pointed to the potential of falling family size to counter-balance the negative effects of rising family instability on children’s life chances (though her study examined only white children). Drawing on Preston (1976), she also emphasized the need to look at family size from the child’s point of view, that is, by reference to sibsize rather than the somewhat different matter of women’s cohort fertility (a topic I return to below). However, Blake’s two-sided view gained little traction

¹ Moynihan referred briefly in his ‘Report’ to high fertility among black women but only in connection with racial differences in population growth rates (Moynihan 1967: 71-2). In an article for *Daedalus*, he showed awareness of large family size as an issue for black children but did not develop the topic (Moynihan 1965: 759). A paper by Philip Hauser in the same journal set out a more comprehensive account but his emphasis on family size as a source of social disadvantage for black children did not attract wide attention (Hauser 1965: 860-62, 865-67).

in the midst of a growing preoccupation with one side of the story – the rising rates of breakdown in the traditional American family and its concentration in marginalised urban neighbourhoods where poor job prospects undercut the economic foundations of stable family life (see, e.g., McLanahan and Percheski 2008, Cherlin 2009, Carlson and England 2011, Morgan 2011, Furstenburg 2011, Heckman 2011, Putnam 2015).

This preoccupation was well captured in Sara McLanahan’s Presidential address to the Population Association of America in 2004 when she pointed to the combined effect of family instability and poor parental job opportunities in giving rise to ‘diverging destinies’ among American children (McLanahan 2004, McLanahan and Jacobsen 2015). Over the past decade, a chorus of academic and journalistic voices has argued a similar line, not least by championing a ‘Moynihan was right’ interpretation of the destabilisation of the American family since the 1960s and its contribution to widening inequalities in American society (e.g. Massey and Sampson 2009, Wilson 2009, Haskins 2009, Patterson 2010, Heckman 2011, Acs 2013, Aigner 2014, Kristoff 2015). The motivation for the present paper is to look beyond that perspective and attempt to recover the strand of the story it misses – the large numbers of siblings that poor children had to cope with as a consequence of the post-war baby boom, the racial and social class gulf in family conditions that experience represented, and the dramatic though incomplete equalisation of that aspect of children’s lives that had come about by the end of the twentieth century.

Measuring sibsize

A technical matter that has to be clarified on the way to achieving that more complete picture is the often overlooked distinction between the adult’s and the child’s perspective on family size, that is, between cohort fertility among women and sibsize among their children (Preston 1976; Jenkins and Tuten 1992; Schkolnikov et al. 2007). When it comes to access to family resources, the number of siblings that children have is crucial but is

poorly captured by the measure of family size most widely used by demographers, namely, the number of children that age-groups of women have (cohort fertility).

The issue here is that mean sibsize among cohorts of children is determined by both the mean and the variance in their mothers' childbearing, not just by the mean on its own. Take, for example, two women who have six children between them and thus have a mean family size of three. That mean is unaffected by the distribution of the children between the two women (the possibilities are three/three, four/two, five/one or six/zero). Matters are different for sibsize among the children since the more they are bunched into one of the two families, the larger their mean sibsize. If the divide is three/three, the children's mean sibsize is 3 but as the divide becomes more unbalanced (that is, as the variance widens), the children's mean sibsize increases: at a divide of four/two, mean sibsize rises to 3.33, at five/one, it rises to 4.33 and at six/zero, it rises to 6.0.

In an important but little noted paper, Preston (1976) analysed these relationships in mathematical terms and produced the following formula for deriving children's mean sibsize from their mothers' mean fertility:

$$\bar{C} = \bar{X} (1 + V_X^2)$$

where \bar{C} is the mean sibsize of the children of a cohort of women, \bar{X} is the mean fertility of that cohort of women and V_X^2 is the standardised variance in women's fertility (i.e. the variance as a ratio of the mean). As this equation shows, the only circumstance where the mean cohort fertility of women matches the mean sibsize of their children is when all women have exactly the same number of children, that is, where variance (and thus V_X^2) is zero. Otherwise, \bar{C} is always greater than \bar{X} . It is possible for \bar{X} to fall but for \bar{C} to remain stable or rise if the decline in women's fertility is accompanied by an increase in variance (as can happen, for example, when the incidence of childlessness among women

increases). Conversely, it is possible for \bar{X} to rise and \bar{C} to fall if an increase in women's fertility is accompanied by a reduction in variance (as happens, for example, if some women move from being childless to having one child). The implication of these patterns is that if we want to trace the evolution of family size over time and compare family size between groups, we have to recognise that the story will differ depending on whether we examine the question from the mothers' or the children's perspective.

Preston applied his formula to census data on the fertility of white and non-white women in the US from 1890 to 1970 and found that while the racial gap in women's completed cohort fertility had reached one of its narrowest points of the period in 1960, the gap in children's sibsize had moved in the opposite direction and reached its widest (Preston 1976: 111-113). In other words, as we confirm below, the 1960s, paradoxically, were a period of exceptional *equalisation of women's completed cohort fertility* but also of *exceptional social inequality in children's sibsize*. Demographic research of that era was alert to the former of these developments but widely overlooked the latter, leading to a scholarly view that the large social disparities in family size that had featured in the early decades of the twentieth century were no more (e.g. Kiser 1960, Kiser, Grabill and Campbell 1968, Glass 1968, 1976).

That picture as generally understood changed little over the following decades: the social differences in mean cohort fertility among women that had emerged by the 1960s became fixed within a narrow band of fluctuation. The view emerged that, despite persisting gaps in cohort fertility, family size was in a new era of relative social equality, prompting a focus on issues such as the age and partnership circumstances of mothers as sources of social disparity (see, e.g. Sweet and Rindfuss 1983, Yang and Morgan 2003, Jones and Tertilt 2007, Morgan 2011). Some strands of research continued to highlight the powerful effects of family size on children's life chances (for reviews, see Heer 1985,

Steelman et al. 2002; recent important contributions include Black *et al.*, 2005, 2011; Bjerkedal *et al.* 2007, Booth and Kee 2009). But this work was disconnected from the analysis of macro-structural trends in social inequality. In consequence, the significance of decline in sibsize for social stratification among children failed to register. We now turn to the data which will enable us to develop a more complete picture of children's changing sibsize over this period.

Social disparities in sibsize among children: new estimates

Data and measures

The key data used in this paper are based on responses to a question on 'children ever born' which was asked of women in the US decennial census of population from 1900 to 1990, except 1920 and 1930. After 1990, the same question was continued up to the present in the US Census Bureau's Current Population Survey by way of the 'Fertility Supplement' fielded in June of every second year. In the CPS, the 'children ever born' question was limited to women aged 15-44 up to 2010, but in 2012 the age-range for the question was widened to include women up to age 50 (which is why I use the data from 2012 rather than 2010 to complete the decennial series on which this paper is based).²

The picture of sibsize extracted from these data for present purposes relates to two age-groups – women aged 45-49 years and children aged 8-9 years. SES differences in sibsize are examined along two axes – race and maternal educational attainment. The data

² The census question on children ever born was asked only of ever-married women from 1900 to 1960 (from 1970 it was asked of all women). Here, as is the norm (Kiser et al. 1968, Preston 1976), single women in those years are counted as being childless, a procedure that would tend to produce an underestimate of fertility since it excluded non-marital births. However, Kiser et al. (1968: 300-02) checked census-based fertility estimates in 1960 against those based on vital statistics and other sources and showed that census underestimates of births were likely to be small (in the region of 3-4 per cent).

are drawn from the Integrated Public Use Microdata Series from the US Census (Ruggles et al. 2015) and the Current Population Survey (Flood et al. 2015).

Women aged 45-49 are included in the analysis as the age-category that represents just-completed child-bearing. Their interest for present purposes is that, by applying Preston's formula just outlined, data on their fertility outcomes can be used to generate measures of their children's sibsize and yield a consistent measure of *completed* sibsize over time. Though that time series is much used here, it has the limitation that the 'children' of 45-49 year old women are not a specific age-category since they range in age from infancy to their early 30s and also span a 30 or more year time period of childbearing among their mothers. Both the age-range and time period they encompass are thus diffuse. In addition, the 'children' in question can be observed in the data we use (which relate to co-resident members of households) only in cases where they are recorded as residents of the same household as their mothers, a condition which holds typically for less than half of them and thus leaves the other half untraceable in the data.

To examine sibsize in a more time and age specific way and among children we can fully observe in the data, we focus on a narrow age-band of younger children and examine sibling numbers and other features of their family contexts in successive birth-cohorts (on the sampling issues involved, see Lam and Marteleto 2013: 20-22). The technique used here is to extract a relevant age-band of children from the micro-data and link them with their mothers' reported number of children ever-born (along with other key variables such as family structure and maternal age and education), thus providing a measure of sibsize among the selected children.

This technique for measuring sibsize requires that the children be young enough to be living with their mothers so that the linkage in the data records can be achieved. A further age constraint arises for years where CPS data are used (in the present instance, the years

2000 and 2012) since the ‘children ever born’ question was asked only of women aged up to 44 in 2000 and up to age 50 in 2012. This constraint means that the children we focus on must be young enough for their mothers to be below these age thresholds at time of measurement in 2000 and 2012 and thus have answered the ‘children ever born’ question. I select 8-9 year-olds here as a suitable age-group to fit within these constraints. At that age children are old enough for their mothers to have advanced some way in their family formation but are young enough to be still largely co-resident with their mothers and not to have a large share of mothers who were beyond the age-thresholds for the CPS question on children ever born in 2000 and 2012.³

Sibsize measured in this way is independent of whether siblings of the reference child are still resident in the family home or even whether they are still alive. Half-siblings are partly included. Maternal half-siblings are captured in the mother’s reported number of children ever born but paternal half-siblings are not. However, paternal half-siblings who live in the same household as the reference child are recorded and are added to the reference child’s sibling count here. Thus, the under-count of siblings in this measure arises from omission of non-resident paternal half-siblings and also, in rarer cases, omission of either full- or half-siblings of a non-resident biological mother.

The focus on 8-9 year olds does not yield a picture of completed sibsize among children but it does provide a consistent account of sibsize in middle childhood (see further below re Table 1). It allows us not only to trace change in children’s family size over an extended period but also to examine linkages with other aspects of the children’s family context such as family structure and parental education. While the resulting family

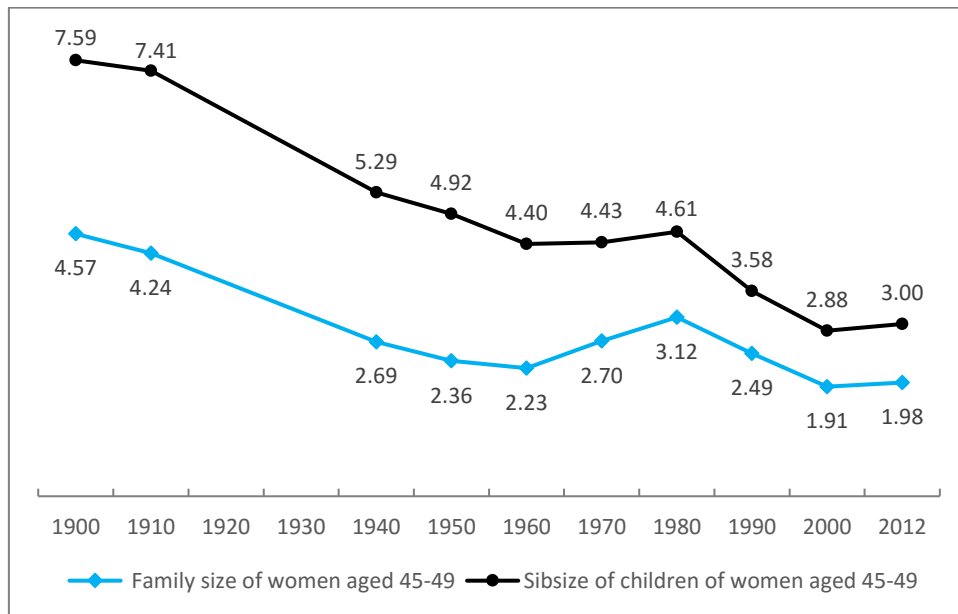
³ In CPS 2000, 9.9 per cent of 8-9 year olds had mothers who were above the age-threshold of 44 for the children-ever-born question and thus are treated as missing cases here. The likely effect is a slight under-estimate of sibsize in 2000 since children with older mothers are likely to have slightly larger sibsizes. The raising of the age threshold to 50 in 2012 largely eliminated this problem.

size data relate to a tight age-band of children, the ages of their mothers are quite varied, ranging from early 20s to early 50s but with a mean age consistently hovering close to 35 (see Table 2 below).

The broad picture: women’s family size and children’s sibsize over time

To contextualise the analysis, Figure 1 takes the story back to 1900 and plots two measures of family size derived from the data just outlined. The first is a conventional demographic measure of family size, namely, cohort fertility among women aged 45-49. The second uses Preston’s formula outlined earlier to derive the sibsize of those women’s children. Keeping in mind that childbearing among 45-49 year old women is likely to have been concentrated in a period some 15-20 years prior to the year of measurement, the trend line for that cohort’s fertility reflects the pre-war decline in childbearing, the post-war baby boom and the subsequent resumption of decline until the end of the century.

Figure 1. Mean family size of women aged 45-49* and sibsize among their children, United States, 1900-2012.



* Data for 2000 are based on women aged 40-44.

Sources: IPUMS – Census of Population 1900-1990, Current Population Survey (June) 2000 & 2012.

The trend-line for sibsize among their children shows a similar trajectory but at a level that is 1.5 to two times higher and with an initially slower rate of decline. In 1960, for example, when cohort fertility among 45-49 year old women had fallen to 2.23, sibsize among their children was almost double that at 4.40. By 1990, cohort fertility among women was *higher* at 2.49 but sibsize among their children was *lower* at 3.58.

Table 1. Mean sibsize of children at age 8-9 and at completion 10 years later (estimated)

	1900	1910	1940	1950	1960	1970	1980	1990	2000	2012
A. Sibsize at age 8-9	5.78	5.62	4.31	3.84	3.98	4.07	3.09	2.86	2.84	2.88
B. Approx. completed sibsize 10 yrs later ^a	7.41	6.68	4.92	4.40	4.43	4.61	3.58	2.88	3.00	
A as % of B	78	84	88	87	90	88	86	99	95	

^a Estimated as mean sibsize of children of women aged 45-49 ten years later. Estimate of completed sibsize for 8-9 year olds in 1910 (which relates to women aged 45-49 in 1920) is interpolated from data on women aged 65-69 in 1940. Sources: IPUMS – Census of Population 1900-1990, Current Population Survey (June) 2000 & 2012.

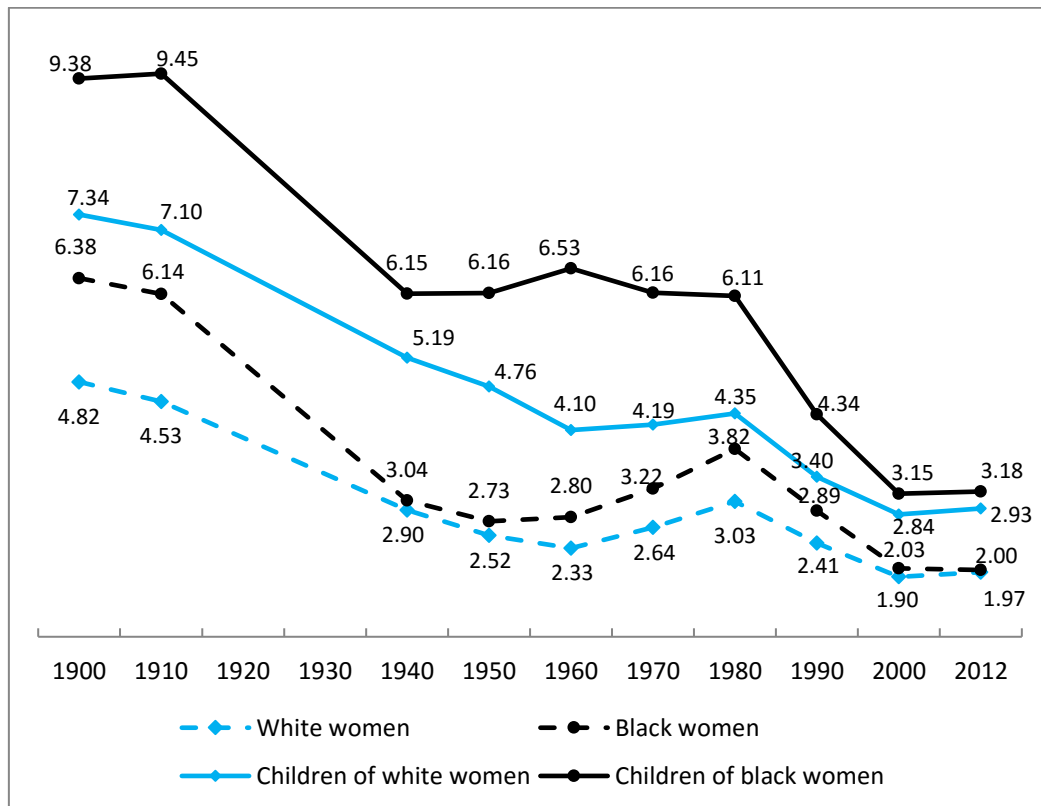
Table 1 shows the changing sibsize of 8-9 year-olds as a further measure of family size for the period. It also gives an approximate indication of how much further those children's sibsizes were likely to grow over the ten years after date of measurement, by which time their sibsizes were likely to be complete. The latter measure reflects the limitation in the focus on 8-9 year olds in the present paper mentioned earlier, namely, that for most of the twentieth century sibsize at that age was incomplete and for many children was a transient feature of middle childhood rather their final sibsize situation. It was only by 1990 that sibsize at age 8-9 years could be counted as more or less complete though since 1940 the gap-to-completion was reasonably modest (the slight re-widening of the gap for the 2000 cohort of 8-9 year olds may be due to the possible slight underestimate of sibsize for that cohort referred to in footnote 4 above). Nevertheless, the tighter age and time focus of this sibsize measure lends it value. It gives a more precise

indication of when downturns in sibsize occurred and points to the 1970s as a critical period: of the entire decline in sibsize of 8-9 year-olds between 1900 and 2012 (a fall of 2.9), one-third (0.98) occurred in the 1970s. The trend for the estimate of completed sibsize in Table 1 shows a somewhat lesser concentration of decline in the 1970s (at 23% of the total decline, with a further 16% of the total decline in the 1980s).

Differentials in sibsize by race

We now come to our core concern, which is to examine social disparities in family size. We look first at differentials by race using measures both of women’s cohort fertility and of sibsize among their children based on Preston’s method (Figure 2). Again we take the story back to 1900 to provide an historical context.

Figure 2. Mean family size among women aged 45-49* and among their children by race, 1900-2012



* Data for 2000 are based on women aged 40-44.

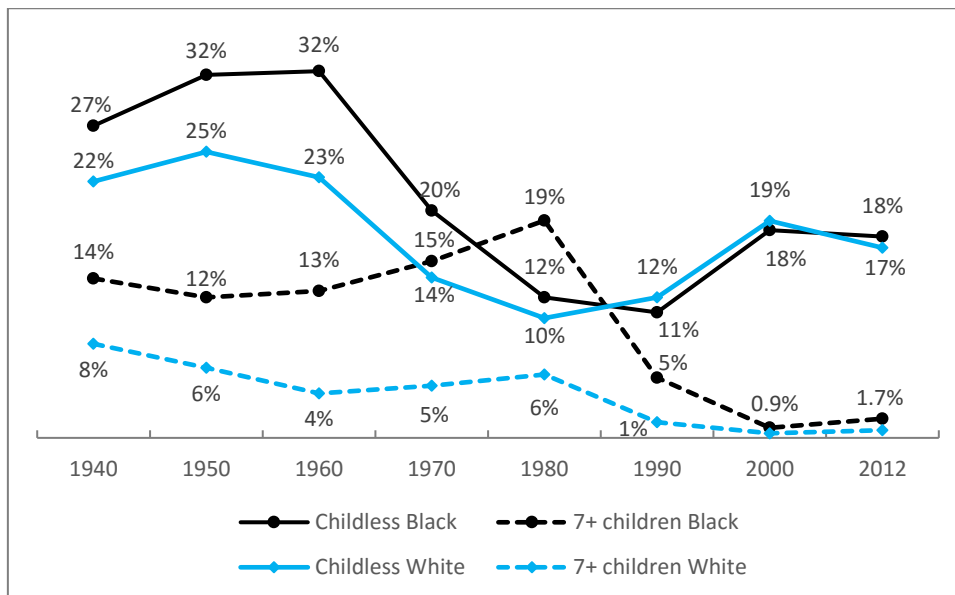
Sources: IPUMS – Census of Population 1900-1990, Current Population Survey (June) 2000 & 2012.

As the dashed lines in Figure 2 show, racial disparities in women's cohort fertility had narrowed by the 1940s and 1950s, widened somewhat up to the 1980s and then narrowed again – the conventional story of change in women's fertility in the twentieth century as outlined earlier. The solid lines in Figure 2, however, show that sibsize differentials among their children evolved differently. Both black and white children's sibsize fell from very high levels in the early twentieth century but black sibsize plateaued in the 1940s as white sibsize continued to decline. The result was that the racial gap in sibsize widened after 1940 and reached a maximum for the century in 1960 (as Preston 1976 showed). In that year, black women aged 45-49 on average had 2.80 children but the mean sibsize of their children was 6.53, an extraordinarily large gap. Corresponding white women, who had 2.33 children, had half a child less than black women but their children's sibsize (at 4.10) was 2.43 smaller than that of black children. The black-white sibsize gap was slightly greater in absolute terms in 1960 than it had been at its previous peak in 1910 (when it was 2.35 siblings) and in relative terms was much greater (the black-white ratio in sibsize in 1960 was 1.59, compared to 1.33 in 1910). The gap remained wide until 1980, at which point it began to contract and had almost disappeared by 2012. *Thus the post-war years emerge as the period of widest racial disparities in sibsize in the twentieth century, while the final quarter of the century witnessed a sharp reduction in this aspect of racial difference in children's family contexts.*

As outlined earlier, mean sibsize among children is driven by both the level and the variance of their mother's childbearing. Figure 3 gives an indication of how variance in fertility changed among black and white women for the years 1940-2012 by focusing on two extremes of family size – childlessness and very large families (those with seven or more children). Wide variance in black women's fertility among the cohorts up to 1960 arose from an extraordinary combination of these two extremes: one-third of black

women aged 45-49 in 1960 were childless⁴ while 13% had had seven or more children. This polarisation of black women's family size explains why sibsize among their children at that time was so large even though their cohort fertility was low. Narrower variance among corresponding white women arose from a lower incidence both of childlessness (23%) and very large families (4%). This caused white children to be more clustered in families of moderate size than was the case for black children.

Figure 3. Women aged 45-49*: % childless and % with very large families (7+ children) by race, 1940-2012



* Data for 2000 are based on women aged 40-44.

Sources: IPUMS – Census of Population 1940-1990, Current Population Survey (June) 2000 & 2012.

Figure 3 also reveals an important racial difference in the nature of the post-war baby boom. Among white women, fertility increase was caused by a fall in childlessness – there was no return to larger family sizes. Among black women, childlessness fell even more steeply (from 32% in 1960 to 12% in the 1980) but there was also a rise in large

⁴ Childlessness among black women in this era, most of which occurred to married women, may have been due to a syphilis epidemic which mainly affected the black population and left many women sterile (Kiser et al. 1968, Farley 1970, Brandt 1988; for an opposing view, see Boyd 1989). The advent of penicillin in the 1940s enabled syphilis to be largely eliminated by the mid-1950s.

families (the proportion with seven or more children rose from 13% in 1960 to 19% in 1980). It was only after 1980 that convergence between black and white women on these indicators set in: the incidence of very large families among black women plummeted and had almost disappeared for both black and white women by the beginning of the 2000s, while the black-white difference in childlessness had already been more or less eliminated by the 1980s.

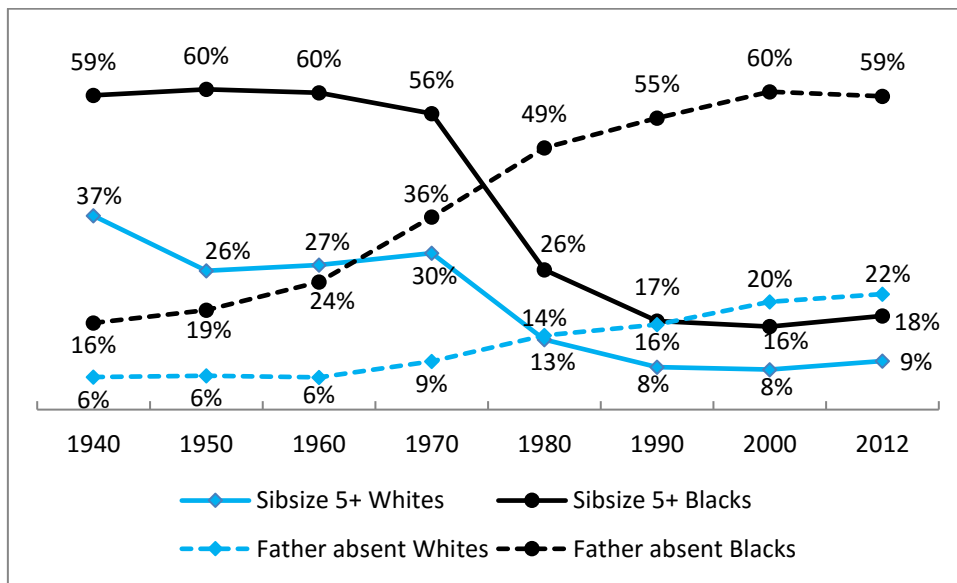
Sibsize and family structure: counter-balancing trends

As indicated earlier, a key concern in this paper is the possible contrast between sibsize and family structure as sources of racial disparity among children and the extent to which trends over time in these aspects of children's family context ran counter to each other. Did the growing disparity in family structure that emerged between lower and higher SES children since the 1960s create a new level of inequality in family circumstances, as the Moynihan Report first argued and much subsequent research has since concurred? Or do we get a different picture if we take family size into account and ask whether old social disparities in children's sibsize have faded as new differences in family structure have emerged, suggesting a potentially more neutral net effect of family change on social inequalities among children over this long period?

To answer this question, we switch our attention to 8-9 year olds, since as outlined earlier it is possible in their case to measure other aspects of their family contexts alongside sibsize, including family structure. The measure of family structure I use here is father absence – whether or not the reference child's father was resident in the child's household – and the measure of sibsize is the percentage of the 8-9 year olds who had a sibsize of five or more. Figure 4 plots these two indicators for black and white 8-9 year olds for the period 1940-2012. The dashed lines in this graph represent the widening racial differential in children's exposure to father absence which has attracted comment

since Moynihan’s day and underlies the ‘diverging destinies’ interpretation of how family change has affected inequalities among children. The solid lines represent the trend in family size and show a different picture. First was the period up to 1960 when larger sibsize persisted among black children and declined somewhat for white children, thus widening the racial gap in sibsize. At the same time the racial gap in father absence was also worsening to the disadvantage of black children. This then was a period when black children were losing ground because of both family size and family structure, echoing the view offered earlier of the years around 1960 as a period of maximal racial inequality in children’s family circumstances.

Figure 4. Sibsize of 5+ and father absence among 8-9 year-olds by race, 1940-2012



Sources: IPUMS – Census of Population 1940-1990, Current Population Survey (June) 2000 & 2012

Having stabilised close to 60 per cent from the 1940s to the 1960s, the share of black 8-9 year olds with sibsizes of five-plus tumbled in the 1970s and 1980s, converging rapidly though not completely towards the reduced sibsize then found among white children. By the end of the century, racial differences in father absence and larger sibling numbers had more or less inverted the corresponding disparities of half a century earlier:

sibling numbers had fallen for black children as father absence had risen and the pattern of black children's disadvantage on father absence in the year 2000 mirrored the pattern of black children's disadvantage on family size of the 1950s and 1960s. *Thus, since the 1970s, the narrowing racial disparities in sibsize have run counter to widening racial disparities in family instability and amounted to a sibsize revolution for black children that transformed their family circumstances and narrowed a previously wide disparity with white children.*

Sibsize differentials by maternal education

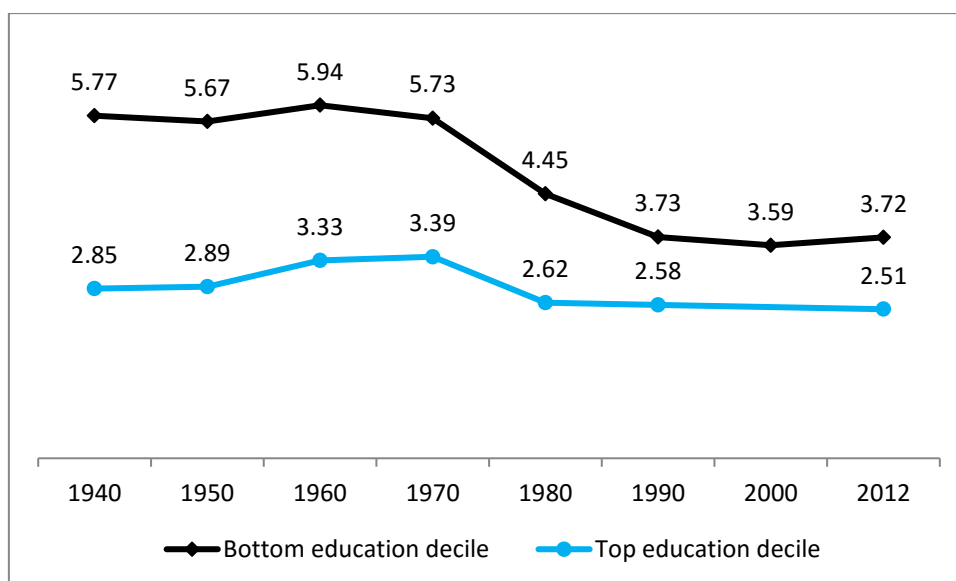
The estimates of sibsize differentials presented so far have focused on race as the stratifying variable. We need also to check the robustness of the patterns identified by including parental education in the analysis, since education is often used as a proxy for social class. The context here is the common view that as a black middle class emerged in the 1970s and 1980s and the white urban poor became more numerous, social class took over from race as the dominant influence on the nature and extent of social disadvantage among American families (Wilson 1987, Massey and Sampson 2009).

To examine educational differentials in sibsize for the period 1940-2012, we classify 8-9 year-olds by their mothers' level of educational attainment. In light of the rapid rise in educational attainment since the 1940s, one useful way of capturing relative educational position is to focus on decile and quartile distributions of educational attainment. That approach is possible only to a degree with the present data as the limited number of categories used to measure educational attainment mean that exact identical proportions cannot be tracked over time. For the period 1940 to 2012, the most consistent approximation we could find was to pick out the top and bottom deciles of mothers in educational terms in each year. The grade-standard which bounded those deciles rose

steadily over time (for example in that the bottom decile of mothers was bounded in 1960 by those who had not gone beyond sixth grade while in 2012 it was bounded by those who had completed high school but not achieved a high school diploma).

Figure 5 shows how sibsize differentials among 8-9 year olds have changed at these two extremes of the educational range (an attempt to capture the top and bottom educational quartiles not reported here produced similar trends for the years for which the data enabled the categorisations to be made). From 1940 to 1970, the sibsize gap by maternal education as measured in this way remained fairly stable, while from 1970 to 1990 a trend towards convergence set in: the sibsize differential was 2.61 in 1960 compared to 1.15 in 1990, though the differential had widened slightly again to 1.21 by 2012. This indicates the incompleteness of the sibsize revolution among lower SES children since a differential of over one in the early 2000s was still substantial and warranted attention as an aspect of social inequality. Yet it was much lower than it had been fifty years previously.

Figure 5. Sibsize of 8-9 year-olds by approximate relative educational level of mothers, 1940-2012



Sources: IPUMS – Census of Population 1940-1990, Current Population Survey (June) 2000 & 2012

Sibsize, race and education: a multivariate picture

To achieve a more integrated descriptive view of changing sibsize differentials by race and maternal education, a multivariate analysis is helpful. Because the dependent variable, the sibsize of 8-9 year olds, is in the form of count data with a limited range and a left-skewed distribution, Poisson regressions are the modelling method used. Models are provided for selected years from 1940 to 2012 (see Table 2 for descriptive statistics).

Table 2. Descriptive statistics for 8-9 year-olds

	1940	1960	1970	1990	2012
Continuous variables: mean (std dev)					
Sibsize	4.35 (2.62)	4.01 (2.16)	4.12 (2.08)	2.83 (1.33)	2.89 (1.31)
Mother's age centred at 35	0.98 (6.80)	0.44 (6.22)	0.11 (6.52)	-0.44 (5.44)	2.03 (6.03)
Categorical variables					
Black	10.1%	11.5%	13.1%	13.3%	12.6%
White	89.9%	88.5%	86.9%	86.7%	87.4%
Mother's education					
Postgraduate	.5%	1.0%	1.7%	5.1%	12.0%
College	6.3%	14.9%	18.0%	42.7%	54.1%
Complete high school	13.3%	35.1%	42.3%	35.7%	22.3%
Some high school	18.6%	24.1%	23.6%	12.9%	7.3%
Elementary	61.3%	24.8%	14.4%	3.6%	4.4%
Mother's marital status					
Single	N/A	N/A	1.0%	5.1%	11.0%
Widowed	3.2%	1.9%	2.2%	1.0%	.7%
Divorced	1.2%	2.3%	4.3%	10.1%	9.1%
Separated	N/A	2.8%	3.9%	4.0%	3.3%
Married, spouse absent	2.8%	1.2%	1.2%	.9%	1.3%
Married, spouse present	92.8%	91.8%	87.4%	78.8%	74.7%
N	5734	46180	41676	22459	2703

The two predictor variables of central interest are black-white race and mother's educational attainment, with the latter measured by reference to fixed categories of educational attainment. The interaction effects for these two variables are examined alongside the main effects. The descriptive statistics for education in Table 2 reveal the sharp upgrade in educational attainment of mothers over the period referred to earlier: in

1960, for example, almost half of mothers of 8-9 year olds had only elementary or incomplete high school education; by 2012, that proportion had dropped to 12%. Two control variables are included because of their availability and completeness in the data, namely, mother's age and mother's marital status. To simplify interpretation of the model intercept, mother's age (the only continuous variable used) is centred at the approximate global mean for mothers of 8-9 year-olds in the entire period, namely, at age 35. As a result, the intercept in the models can be read as the conditional mean sibsize of 8-9 year olds in each year examined. A quadratic term for mother's age is included to control for non-linearity. In regard to mother's marital status, as noted earlier, single women were not asked the children-ever-born question until 1970 and thus there are no 8-9 year-olds with single mothers in the data before that date. 'Separated' was not used as a marital status category in the 1940 census.

As the results of the regression models in Table 3 show, the race effect, when the other factors are controlled for, peaked in 1960 at 1.31 – that is, black 8-9 year-olds had 1.31 times (or 31%) more siblings than white children. That effect had already begun to decline by 1970 and had halved by 2012 but still remained significant. Maternal education emerges as a strong effect in the expected way: taking 8-9 year-olds whose mothers had completed high school as the reference category, those with less educated mothers had bigger sibsizes and those with college educated mothers had smaller sibsizes. The interaction terms for race and maternal education are significant in 1960 and 1970 and to a lesser degree in 1990 and show that in those years the maternal education effect was amplified among black children: those with less educated mothers had an additional increase in sibsize of 5-13% (depending on precise year and educational level) over and above the effect of the same factor among white children, while those with college educated mothers had an additional decrease in sibsize. The latter decrease was

especially large, at close to 50%, among black children in 1960 whose mothers had postgraduate education, but the numbers involved were small, accounting for only 0.5 per cent of black 8-9 year-olds in that year.

Table 3. Poisson regression models for sibsize of 8-9 yr olds in selected years: exponentiated (odds-ratio) coefficients

	1940	1960	1970	1990	2012
(Intercept)	3.14***	3.47***	3.78***	2.81***	2.99***
Race=black	1.18	1.31***	1.22***	1.19***	1.16*
Mother's education					
Postgraduate	1.13	0.88***	0.80***	0.81***	0.87**
College	0.88***	0.96***	0.94***	0.96***	0.93*
Complete high school (ref)	1.0	1.0	1.0	1.0	1.0
Some high school	1.25***	1.12***	1.14***	1.15***	1.24***
Elementary	1.47***	1.37***	1.31***	1.42***	1.26***
Mother's marital status					
Single	N/A	N/A	0.81***	0.84***	.90*
Widowed	0.98	1.01	1.03	1.05	1.12
Divorced	0.73***	0.86***	0.94***	0.90***	.92
Separated	N/A	0.95***	0.99	0.99	1.10
Married, spouse absent	0.82***	0.97	0.98	1.01	.89
Married, sp present (ref)	1.0	1.0	1.0	1.0	1.0
Mother's age	1.034***	1.01***	1.02***	1.019***	1.01*
Mother's age ²	0.999***	0.9997***	0.9993***	0.999	1.00
Race x education interactions					
Black x postgrad	1.10	0.54***	0.71***	0.973	0.71
Black x college	0.51	0.90**	0.94*	0.92*	1.01
Black x complete HS (ref)	1.0	1.0	1.0	1.0	1.0
Black x some HS	1.10	1.10***	1.13***	1.09*	0.94
Black x elementary	1.07	1.05**	1.07***	0.91	1.12
Chi ²	2007.5***	8769.8***	2066.2***	1606.0***	125.4***

* p < 0.5 ** p < 0.01 *** p < 0.001. N/A: not available

Taking all the coefficients for maternal education in Table 3 together, something close to stability over time is evident – there was no consistent reduction in coefficient sizes for mothers' level of education, in contrast to the weakening association with race. Yet, that near-consistency in effect sizes for education entails significant change in *absolute* sibsize of children, even those whose mothers had not shared in the general educational upgrade. For example, as mothers with elementary education became an ever more

marginal sub-population in educational terms (Table 2), their children came closer to the middle ground in regard to sibling numbers: calculating from the relevant coefficients and the intercept in Table 3 and taking the reference values for other variables, sibsize among those children was high in relative terms in 2012 (at 3.77) but, having fallen from 4.95 in 1970, was down to the same level experienced by children whose mothers were high school graduates forty years previously (at 3.78). This shows that while rising educational levels among parents was one cause of the decline in children's sibsize (consistent with the axiomatic status now accorded to education as a driver of fertility change – Lutz and Butz 2014), changed behaviour among mothers within educational grades, especially at the lower levels, also had an effect.

Of the control variables, it is notable that in all years, one or other form of instability in the mother's relationship with the reference child's father had the effect of reducing the child's sibsize – or, to put it the other way, father's continued presence had the effect of adding siblings to the child's family. In 1940, the main damping effect of father absence occurred mothers who were divorced or separated. Divorce alone had similar effects from 1960 to 1990, and unmarried parenting acted similarly from 1970 (and did so especially in 1970). While father absence is usually thought of as harmful for children, its effect in limiting the number of siblings with whom children had to compete for family resources could be considered a compensating factor, though that factor had become quite weak by 2012.

Challenges and questions for research

This paper has sought to show that since the 1950s, trends in two sources of social disparity in children's family contexts in the United States have moved in different and sometimes opposing directions over time. The incidence of mother-headed families has increased and has become more differentiated by social status, but children's sibsize,

having become sharply more unequal during the post-war baby boom, turned towards social convergence in the 1970s and 1980s and led to a dramatic reduction (though not complete elimination) of social differentials in sibsize by the end of twentieth century.

Space precludes an analysis here of the full significance of these developments but it is possible to outline some challenges they pose for existing scholarship and indicate directions for future research. A key issue is to assess the effects of convergence in sibsize on social inequalities in children's lives and weigh these up against the 'diverging destinies' that, as outlined earlier, most scholars now see as a dominant impact of family change for American children. The 'resource dilution' perspective on family size has long argued that the family resources available to children can be weakened by the number of siblings in the family (Downey 2001, Steelman et al. 2002). The implication is that the convergence in sibsize in the US since the 1970s may have exerted an equalising influence on family resources available to children and thus on their life chances. These trends, then, may have counterbalanced the disequalising effect of growth and social polarisation in weakened family structures.

A key challenge for future research is to establish how far this is so. One arena where this challenge arises is in regard to education since inequalities in educational outcomes are fundamental to inequalities in other domains in life. Within that arena, the long-standing issue of the black-white student academic achievement gap has been especially prominent in American research and is relevant to our analysis here (for an overview, see Barton and Coley 2010; Neal 2005 and Berends et al. 2008 are key recent studies). There is now something close to a general scholarly consensus that steady progress in reducing the gap in academic test performance between black and white children was achieved between the early 1970s and late 1990s but then progress stopped, with the gap since then 'bouncing around a straight trend-line' (Barton and Coley 2010: 14). In light of the sharp

black-white convergence in sibsize from 1970-1990 identified in this paper and the tailing off of that convergence after 1990, sibsize effects would seem to be likely contributors to this evolution. However, a trawl through the literature in this field turned up only one study which examined this factor, namely, that by Grissmer et al. (1994) which sought to assess the role of family change as a driver of the convergence in the black-white achievement gap in the years 1970-1990. This study correctly pointed to black-white convergence in sibsize as a key development in the period and concluded that it was one of two family transitions that had helped narrow the racial gap in teenagers' academic test scores (the other was the rapid catch-up in educational attainment recorded by parents of black teenagers).

Though Grissmer's research is much cited and recognised as pioneering work (Barton and Coley 2010: 8), its findings on sibsize attracted little attention and the topic soon dropped out of the scholarly literature, apart from a brief reference in a follow-up study by Nowell and Hedges (1999). Data problems are one reason: the main long-term data source in the field, the National Assessment of Education Progress (NAEP), collects limited information on family background and requires much imputation and piecing together of diverse data sources to capture sibsize effects (a task Grissmer's research team thought worthwhile but subsequent scholars have been less keen on). The more general reason, however, seems to be lack of awareness of sibsize as a factor in children's lives. Grissmer's study may have failed to impinge on this lack of awareness in part because it used a measure of sibsize (siblings aged under 18 living in the same household) which was effective in indicating sibsize decline over time but got the scale wrong. According to Grissmer's data, for example, the proportion of black 14-15 year olds with sibsizes of five or more declined from 38.5% in 1970 to 9.4% in 1990 (Grissmer et al. 1994: 116). This compares to the decline from 56% to 17% recorded for

the same sibsize among black 8-9 year olds shown in Figure 4 above. The challenge for research in this field, then, is not simply to resurrect the concern for sibsize pioneered by Grissmer's team in the early 1990s but also to measure *total* sibsize and not just co-resident sibsize so that its real significance for the evolution of the black-white achievement gap can be assessed.

Another strand of research where there is a similar need to bring sibsize into the picture is that which examines the impact of family change on trends in income inequality. Many studies have examined the effects of rising of lone parenthood on income inequality over time (McLanahan and Percheski 2006) but since these studies typically do not factor family size into their analyses, their value for tracking income inequalities affecting children is limited. The focus on income pooling among parents and how it is affected by union break-up which has dominated these approaches needs to be complemented by analysis of 'resource dilution' associated with family size and how that factor has improved for children, particularly lower status children, since the 1970s (on sibsize and resource dilution, see Blake 1989, Downey 2001).

If the consequences of the sibsize transitions described here constitute one broad field for future research, the causes of those transitions make up another. The broader context here is the need for demography to examine fertility transition from a children's perspective (see, e.g. Lam and Marteleto 2013, Schkolnikov et al. 2007), assemble the narrative details in societies and regions around the world and on that basis seek to develop an understanding of how and why modern sibsize decline has come about.

Conclusion

Starting with Daniel Patrick Moynihan in 1965, a line of prominent American social scientists has paid close attention to widening social disparities in family structure as a driver of social inequality among children in the United States but has overlooked the

social convergence in sibsize which occurred at the same time (for a recent instance, see Putnam 2015: 43-75). The reason for the elision of family size from the picture of social disparities in children's family contexts is hard to fathom, since the topic had preoccupied social scientists in the first half of the twentieth century and since then the data and research have been available to show its continuing importance for children's lives. In any event, that elision had led to an unduly pessimistic picture being painted of what has happened to American family life over the past half century and of how family change has affected social inequalities among children.

The analysis presented here shows that while the pessimistic picture identifies a real development it is nonetheless incomplete, distorts the historical record and misrepresents the novelty of the current situation. Lower status American children today are indeed much more likely than their higher status contemporaries to grow up in a household where no father is present and where they are economically and socially vulnerable as a result. Those children are also more likely to have had that experience than their grandparents did in their own childhood in the 1950s and 1960s. However, the children who grew up in lower status families fifty years ago themselves faced a different kind of vulnerability – that which arose from being one of five, six, seven or more siblings, a risk which was especially pronounced where the father remained in place and endowed his wife with ever-more children. Evidence of the nature of that vulnerability is abundant. Mollie Orshansky's pioneering studies of poverty in the 1960s found that, in the context of a general US poverty rate of 15%, the poverty rate among families with five children was 36% and among *black* families with five children was 74% (Orshansky 1965, Table 8). When Judith Blake (1989) trawled through US data for the 1960s and 1970s, she found that large family size not only held students back from completing high school but had negative effects on cognitive development and educational attainment even in the

early stages of grade school. Blau and Duncan's seminal analysis of social mobility found that larger family size was a significant impediment to occupational attainment in adulthood (Blau and Duncan 1967).

Social science yet to go beyond these indications and assess whether it was more challenging for lower-status children to grow up in the 1960s with two parents and many siblings than to grow up today with one parent and fewer siblings. Nevertheless, it seems reasonable to start take as a starting assumption that the large family and the unstable family are each socially and economically vulnerable in their own way and that the transition from one to the other over time as the dominant family type among the less well-off is best thought of as a change in form of risk rather than the absolute increase in risk that most accounts of the rise of mother-headed families today would seem to imply.

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