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The reproductive revolution

John MacInnes and Julio Pérez Díaz

Abstract

We suggest that a third revolution alongside the better known economic and political ones has been vital to the rise of modernity: the reproductive revolution, comprising a historically unrepeatable shift in the efficiency of human reproduction which for the first time brought demographic security. As well as highlighting the contribution of demographic change to the rise of modernity and addressing the limitations of orthodox theories of the demographic transition, the concept of the reproductive revolution offers a better way to integrate sociology and demography. The former has tended to pay insufficient heed to sexual reproduction, individual mortality and the generational replacement of population, while the latter has undervalued its own distinctive theoretical contribution, portraying demographic change as the effect of causes lying elsewhere. We outline a theory of the reproductive revolution, review some relevant supporting empirical evidence and briefly discuss its implications both for demographic transition theory itself, and for a range of key social changes that we suggest it made possible: the decline of patriarchy and feminisation of the public sphere, the deregulation and privatisation of sexuality, family change, the rise of identity, 'low' fertility and 'population ageing'.

Introduction: Kingsley Davis and reproductive institutions

There shall be no more thence an infant of days, nor an old man that hath not filled his days: for the child shall die an hundred years old.

Isaiah 65:20

Seventy years ago, *The Sociological Review* published an iconoclastic article by the young Kingsley Davis arguing that low and falling fertility rates in Western societies demonstrated that 'industrialism' was undermining the family and threatening population reproduction. In mobile, rationalised, society the family risked extinction because only the joint involvement of its members in a heterogeneous range of social functions had previously provided the basis for kinship bonds strong enough to regulate sexual activity. Under 'familism' fertility had been kept high because children were the foundation of the family 'and if one does not fit into the family organisation one does not fit

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into society'. However, modernity facilitated 'unconventionalised intimacies' and reduced marriage to 'an amorous adventure' causing the collapse of fertility: 'in a mobile society children are, at any level, a hindrance to social climbing . . . As our mobile society, with its doctrine of equal opportunity and its adulation of the self made man, continues to nullify the inheritance of status, it continues to kill the family'. He suggested that in the future fertility could only be sustained by 'a system in which the father's role is assumed by the state and the mother's role by professional women paid by the state for their services' (1937: 295, 296, 297, 301, 304).

Davis thus married pessimism about the future of fertility and the family with precocious insights into social change, anticipating more recent analyses of 'plastic sexuality', 'pure relationships' (Giddens, 1992) and women 'marrying' the state by over half a century. However the unanticipated 'baby boom' which was starting even as he wrote, refocused demographers' attention on high fertility and population growth in the developing world rather than low or falling fertility in industrialised countries. Davis revised his earlier ideas (which had been echoed by Landry in France (1934), Myrdal in Sweden (1968) and Charles in Britain (1934)) and along with Princeton colleagues (Davis, 1945; Kirk, 1944; Notestein, 1945, 1953) developed what became demographic transition theory. This much more optimistic theory proposed that modernisation caused falls first in mortality and then fertility which established a new demographic equilibrium around low levels of both. The cold war, and the fear that excessive third world population growth might make Communism an attractive political option, turned demographic transition theory into a high profile, politically expedient and well funded orthodoxy (Hodgson, 1983, 1988) in which the focus was on how to reduce fertility in the developing world rather than worry about its fall.

As a result Davis's early ideas about the interconnection between reproductive institutions, fertility, gender and family change faded from view. On the contrary, Parsons' (1956) seminal article on the nuclear family (with a caustic aside about alarmist predictions of 'race suicide' which might well have had Davis in mind) argued that it could function both as a socialiser of gender identities and a reproducer of population *because* (in contrast to the public sphere) it continued to be founded on status ascription by sex. When the end of the baby boom again brought low, or 'below-replacement' fertility to Europe in the 1970s, demographic theory focused on changes in values (individualism, self realisation) and innovation in contraceptive technology (the pill) to postulate the existence of a 'second' demographic transition (Van de Kaa, 1987, 1990, 2002; Lesthaeghe, 1995). However, despite its academic and policy hegemony, both classic and second demographic transition theories always struggled to fit the empirical detail of evidence produced by demographic and historical research (Cleland and Wilson, 1987; Szreter, 1993, 1996; Robinson, 1997; Cliquet, 1991; Coleman, 2003). As Cleland (2001) argues pre-transition societies were characterised by a heterogeneous range of reproductive regimes that sustained fertility which was high enough to balance low life

expectancies; when mortality falls so too, eventually, does fertility but the mechanisms and timing of such change still lie beyond any existing theory.

Because demographic theory evolved in this way, focusing on the causes of fertility decline; and because it prioritised the search for a quantitative, cross-sectional, statistical correlation between fertility, mortality and other variables using period measures which are often poor at capturing social change (MacInnes and Pérez Díaz, 2009), we believe it has tended to overlook much of the significance and consequences of the truly profound historical change it was studying. Meanwhile post-war sociology lost its previous interest in declining fertility and no longer sought to connect this with the changes in family and gender relations to which it turned its attention, mostly in a debate with Parsons' theory.

As a result the significance of a vital process in the rise of modern society, that is the revolution in the efficiency with which mortal human beings replace themselves, which we call the reproductive revolution, has been unduly neglected and poorly understood. It ought to rank alongside the political and industrial revolutions that ushered in modernity, transforming society and economy, creating the modern state and consolidating the rise of individualism (Hobsbawm, 1962). We thus outline here a theory of the reproductive revolution that might allow us to integrate what are empirically well established developments in mortality, fertility, the family and gender relations in a more coherent way than that offered by existing theories of the first and second demographic transitions.

The reproductive revolution

Although sociologists and demographers often treat population as if it were a stock, it is a flow based on the generational reproduction of its members. Let us consider a closed population (that is one not subject to migration). A population flow is a system with inputs that sustain it over time, in contrast to the limited duration of its components – individual human lives – and a level of efficiency that determines the necessary volume of such input (Bertalanffy, 1950). Henry (1965) demonstrated that the years of life lived by a cohort of births, or mean cohort life expectancy, measures the efficiency of a population system, since longer lives mean that a proportionately lower birth rate will be needed to sustain any given volume of population. Population reproduction is thus a balance between two analytically separable components which are nevertheless inextricably connected in the real world: births, or fertility, and deaths, or mortality. If reproductive efficiency is low, short mean lifespans mean that population can be maintained only by a high volume of births. If it is high, a lower rate of births suffices. Although this might appear to be a statement of the obvious, in practice, demographic analysis of reproduction has tended to concentrate on fertility, at the expense of mortality, for political, theoretical and technical reasons that we need not go into here.

There is a second element which must be taken into account, and which gives the revolutionary change from low to high efficiency its particular form. Births occur only to women in their fertile years (conventionally taken as ages 15 to 44 or 49). As far as population replacement is concerned, the years of life of women who die before completing their fertile years are wasted. Thus while this proportion is decreasing, the efficiency of the system is increased not only by the overall increase in mean life expectancy but also by the fall in such wastage. The historical period in which this occurs thus produces a rapid increase in efficiency that can never be repeated. This is the essence of the reproductive revolution.

There is an additional, but analytically distinct, component of the reproductive revolution: the relationship between the years of life attained by each birth and the work, reproductive effort or 'investment' dedicated to it. We do not address this second component here, except to note that the extension of the division of labour and technological progress has also raised the productivity of such work, and that by decreasing the volume of births necessary for population reproduction, the reproductive revolution made possible increases in the volume of such work associated with any individual birth.

The progress of the reproductive revolution thus resembles a logistic curve. The fertility potential of humans is high. Some groups have reached averages as high as nine or ten live births per woman. While mortality was high and erratic, this potential had to be fairly fully employed simply to maintain the volume of population flow because reproductive efficiency was low. Up until the seventeenth century, in what Omran (1971: 512) called the age of pestilence and famine 'life expectancy was short and human misery was assured'. Data is scanty and requires painstaking effort to reconstruct, but it appears that crude mortality rates oscillated erratically with epidemics, famine or warfare between a range of around 20 to 50 per 1,000 (but with occasional much higher peaks) while mean life expectancy at birth ranged from around twenty to the low thirties (Omran, 1971; Coale, 1986; Livi Bacci, 2001). Cowgill (1970) estimated that as few as one in ten girls born in seventeenth century York survived to reach their fertile years.

Despite the great variability in family size that characterised the past (alongside those who had very large families were those with few or no children) it is clear that the majority of women passed most of their brief adult lives pregnant, breastfeeding or rearing dependent children. Only those fortunate enough both to live long lives and have sufficient power, resources or status to delegate their reproductive work to others could escape this fate. As the most important social 'means of production', women's bodies, as well, of course, as the women inhabiting them, were universally subject to intense but variable forms of social control (Gil Calvo, 1991; Meillassoux, 1981; Rubin, 1977). It thus seems plausible to attribute the universal but socially variable nature of patriarchy, which systematically restricted alternatives to motherhood for women, to low reproductive efficiency.

Table 1 Female birth cohorts' survival to childbearing ages

Percentage surviving to age . . .	Early Cohorts		1870 Cohorts	
	15	45	15	45
Sweden (1751)	61.4	44.3	75.4	62.9
France (1806)	55.0	38.3	60.7	49.9
Denmark (1835)	70.1	53.0	73.2	62.3
Iceland (1838)	69.9	55.3	76.0	64.1
Eng and Wales (1841)	63.8	46.9	66.1	52.7

Sources: Vallin and Meslé n.d. (France) Human Mortality Database n.d. (Other countries).

Because our interest is in the survival to different ages of successive generations we need *cohort* based mortality data describing the subsequent mortality across time of those born in the same historical period (eg a calendar year), as opposed to *period* data describing those dying at the same point in time, regardless of when they were born. Unfortunately such data is available for only a handful of countries for periods near the start of the reproductive revolution. Table 1 shows such data for female cohorts born before 1850. For all these countries and periods, between and third and a half of all women died before entering their fertile years. A further tenth to one quarter of the original cohort died by the time they reached the end of those years. Within this time surviving women would very likely see one or more of their several children predecease them, while they could have little confidence that either they or their husbands would themselves survive to see their children reach adulthood. Thus, at the start of the reproductive revolution lives were short, and from a 'reproductive' point of view, a half or more of all births were wasted.

The reproductive revolution occurred as falls in mortality both increased the proportion of women surviving into their fertile years (and throughout these years) and raised the life expectancy associated with each birth. For cohorts of women born in 1870, almost two thirds were surviving to the end of their fertile years in Sweden and England and Wales, while the mean life expectancy of their children was already approaching 60 years. In Spain, however, the equivalent figure was barely one third, with mean life expectancy below 40. Figure 1 shows the progress for cohorts born in 1900, for countries where we have located cohort mortality data. By 1930, in the midst of their childbearing years, between four fifths (Denmark) and two thirds (Italy) were still alive, their children could on average expect to live seventy years or more. Parents faced much lower risks of their children predeceasing them.

Within this process, fertility rates can fall dramatically, while the population grows rapidly. Because the revolution occurred relatively late and rapidly there, Spain shows its empirical progress unusually clearly, and it may thus be

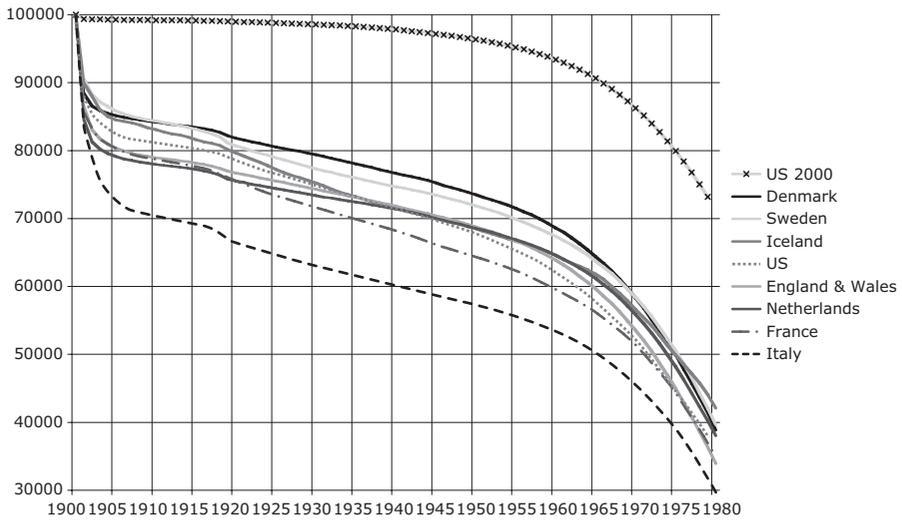


Figure 1 *Survival curves female birth cohort 1900*

Source: *Bell and Miller (2005) (USA); Vallin and Meslé (nd) (France); Human Mortality Database (nd) (Other Countries).*

no accident that it was here that the origins of the idea of a reproductive revolution first developed (Pérez Díaz and MacInnes, 2008). The speed and historical compression of modernisation produced a particular constellation of generations with contrasting historical experiences living side by side, rather like a mass of geological strata concentrated in a small space. Spanish women born in the 1870s had an average of four and a half children each. Their counterparts fifty years later had two and a half. This decline was enough to push the net reproduction rate (the mean number of daughters born to women surviving to their fertile age) below one. However the gains in life expectancy of the children they produced meant that the rate of reproduction of years of life never fell below 1.2 and for most of this period was above 1.4 (Cabré, 1999; Pérez Díaz, 2003b).

For comparison, Figure 1 also shows the projected mortality of women born one century later in the US. In almost all affluent states, less than one per cent of women born today will die before reaching their childbearing years, and barely more than that in the course of those years themselves. Life expectancy at birth is above 80 and rising by about 1.5 years each decade (Bongaarts, 2007). Depending on whether we assume longevity to have a set biological limit or not (Olshansky, Carnes and Cassel, 1990; Wilmoth, 1997; Wilmoth *et al.*, 1999, 2000) the logistic curve of reproductive efficiency either levels off, or continues at a much gentler rise. The increase in efficiency falls off steeply once ever larger proportions of women survive through their childbearing

years, since it now depends only on increases in years of life per birth, rather than on the combined effect of this and reductions in female mortality prior to menopause.

Once the reproductive revolution is complete, virtually all live long enough not only to become parents themselves, but also to enjoy a long and active life after that, not only seeing their children become independent but seeing them having children (and even grandchildren) themselves. In the UK in the year 2000, six out of ten babies born had *all four* grandparents known to be alive when they were born, while a mere two per cent had only one or no surviving grandparent¹. The revolution unleashes an unprecedented era of demographic security: the liberation of human beings both from the grave risk of early death and from the burden of reproductive work that was its inevitable corollary. In broad terms the reproductive revolution more than halved the mean number children each woman needed to bear to maintain the population (from around five or six to around two) while it more than doubled the lifespans within which they and their partners might perform this task.

Because it is the mass survival of women to the end of their fertile years that causes the reproductive revolution, it is an unrepeatable historical event. Its proximate causes lie in social and economic progress that facilitated such mass survival. However the dynamic of the revolution itself is demographic, determined by the empirical characteristics of the biology of the sexual genesis and mortality of human beings. The reproductive revolution, like its economic and political counterparts, developed unevenly and in very different ways. We can gain an indication of this by comparing the year in which cohorts of women first arrived at the very end of their childbearing years (50) with a majority of their original members alive. This occurred as early as 1868 in Sweden, around 1880 in Denmark, 1891 in Canada, 1897 in England and Wales, 1909 in the Netherlands and 1910 in France, but not until 1936 in Italy and 1953 in Spain. It progressed gradually in Sweden and France, and rapidly in Spain. The impact of imperialism and colonialism, the geopolitics of population policy and the potential to transfer such things as medical or public health knowledge or contraceptive technology across state frontiers, has meant that the experience of those states that pioneered the revolution could not simply be repeated in those that followed.

The reproductive revolution and fertility decline

If we accept the reproductive revolution as a hypothesis, it comes to appear as the origin of a substantial range of social change, which both facilitated its companion revolutions and formed a vital material substrate to modern society.

Efficient reproduction enabled fertility to fall and thus liberated resources for production. The substantial proportion of short and precarious lives

devoured by the need to recreate life itself became a much smaller part of longer, more secure lives. We can analyse reproduction as a fourth (or rather, first) sector of the economy, analogous to agriculture, industry and services. Just as in the case of agriculture and industry, rising productivity shrunk the workforce and enabled its expulsion to other sectors in the form of people dedicating relatively much less time to reproduction across their life course. This shift became visible as the plummeting fertility rates which so worried Davis, his fellow demographers and states (Teitelbaum and Winter, 1985) prior to the 'baby boom', since they thought, quite wrongly, that they must lead to population decline. There is no *causal* link between reproductive efficiency and fertility decline, but history has yet to provide any example of a state where such efficiency gains, once established, have been devoted to multiplying collective reproductive power rather than diminishing the proportion of effort dedicated to reproduction.

This can be shown by examining the cross-state correlation of mortality and fertility. Unfortunately we must rely on a period measure, the total fertility rate (TFR) which represents the fertility for a hypothetical group of women, unaffected by mortality, that experience the age-specific fertility rates for a given point in time *as if* these were the characteristics of a cohort of women across a life course. However the distortion this introduces can safely be ignored for our present purposes. If we define 'high' fertility as a TFR above 3.8 (the peak reached in the USA in its post-war baby boom 50 years ago) and take 'low mortality' as life expectancy at birth of 69 or more (its level in the US at that time) we find states with low mortality but high fertility accounting for under one percent of the world's population: Iraq, Saudi Arabia, Oman, the West Bank and Gaza, and perhaps more surprisingly (and on the borderline) Paraguay.² In all these states fertility is falling: in the case of Saudi Arabia by some 40% over the last two decades.

The reproductive revolution and the 'cost' of children

Demographic transition and household economics theories have generally concluded that economic progress, the rise of the market and decline of household based subsistence economies increase the costs of children and thus help explain falling fertility, despite the difficulty of squaring this with empirical evidence (Robinson, 1997; Cleland and Wilson, 1987). Caldwell (1982) emphasized a reversal in the intergenerational flow of wealth. Becker (1991) highlighted the increasing opportunity costs of children, and that of investment in their 'quality'. Myrdal (1968), Landry (1934) and Davis (1937) all suggested that the state needed to socialise the costs of children since population reproduction was a public good that was now borne as a private expense. Titmuss saw the declining birth rate as a 'parents' revolt' in 'acquisitive societies' (1942). As women's employment expanded across the twentieth

century, the relationship between fertility and women's employment moved to the centre of this debate about the costs of children, driving European states anxious to reinforce both fertility and mothers' employment rates to discover a new interest in work-life balance policies (MacInnes, 2006a). Yet even the earliest versions of this argument, well illustrated by Davis's 1937 article, were haunted by a paradox. How could the cost of children be driving down fertility if the most palpable and obvious result of economic progress was rising living standards and it was usually the most affluent who were the first to restrict the size of their families?

Most attempts to square this analytical circle focused on the 'opportunity' rather than direct costs of children. The value of the time spent bearing and rearing them must increase with the general level of affluence, representing both men's and women's current or future earning opportunities and time consuming leisure activity foregone. However general economic development, by multiplying opportunities, must by definition increase the 'opportunity cost' of all time consuming activity (Becker, 1965; Linder, 1970). Having children may require foregoing ever expanding leisure opportunities, but no more so than enjoying leisure opportunities requires foregoing ever expanding opportunities to have children!

On the contrary, an analysis based on the reproductive revolution suggests that the social cost of fertility *must have fallen*. Indeed, since pregnancy and childbirth provide a classic example of what Baumol (1967) defined as a 'technologically non-progressive activity' – one in which labour productivity cannot be increased by technological innovation – the dramatic fall in this cost, driven by the approximate trebling of longevity and consequent fall in fertility, represented a substantial, unprecedented (and unrepeatable) gain.

The resolution of this paradox requires recalling the analytical distinction we made above between the cost of population reproduction in terms of the years of life attained by each birth and the work or reproductive effort dedicated to each birth, broadly analogous to that made by Becker (1991) between the quantity and quality of children. Only because the costs of the former fell was it at all possible to even countenance a rise in the costs of the latter. Similarly, only because the reproductive revolution allowed fertility to fall was it possible for women's employment to expand in the way in which it did. That is to say, what have often come to be analysed as the causes of falling fertility were rather one of its many consequences. Greater resources could be dedicated to each child only because they were fewer, and longer lasting. People in societies that have gone through the reproductive revolution do not have fewer children because they can no longer afford them. On the contrary, they have fewer children because, for the first time in human history, they, together with the societies they inhabit, can afford *not* to. Indeed, perhaps the most fundamental consequence of the drastic fall in the cost of fertility was that it enabled the systematic denial of alternative opportunities to motherhood for women to be overthrown. The reproductive revolution made the defeat of patriarchy possible.

The collapse of patriarchy

The reproductive revolution has eroded the material base of patriarchy by lessening the importance within people's lives of the ineluctably biological division of labour in sexual reproduction, thus paving the way for the feminisation of the public sphere and creating the material context for successful feminist struggle. The *idea* of equality between men and women has existed for millennia. Liberalism, or discourses of human 'natural' rights, have been defenceless against feminism (Mann, 1994). Once it is admitted that natural differences between men are irrelevant to their moral equality, it is difficult to argue that such differences (of sex) between men and women *are* relevant, although Parsons' 1956 essay on the family, reproduction and gender identities could be seen as a spectacular but doomed attempt to do just that.

However the potential for the *practical* realization of greater sexual equality has only been released by the reproductive revolution, together with the evolution of the potentially sex-blind markets, bureaucracies and politics, and shift of production from the household towards the public sphere that this revolution had itself helped to create. Within this altered scenario, the influence of the core biological division of labour is reduced, both because fertility levels fall, and because technological innovation and the widening division of labour in reproduction weakens the link between sex and such work. This core feminizing logic within modernity ultimately leads to contemporary seismic shifts in what is commonly termed gender relations (Connell, 2002) but which we prefer to think of as social relations between the sexes (MacInnes, 1998). Perhaps the greatest achievement of the reproductive revolution has been to liberate women by dint of reducing the relative scarcity of their reproductive labour.

Ideology may still portray women as 'naturally' more suited than men to infant care but this division of labour is no longer *biologically* imposed and is rapidly being socially redrawn. Thus as well as mounting evidence of a slow but substantial increase in the proportion of reproductive work done by men (Gershuny, 1992), there is overwhelming contemporary support, on the part of both men and women, for greater change. In separate surveys conducted between 2002 and 2004 in Europe and North America, over nine out of ten women *and men* agreed not only that 'men should do more childcare' but also that they 'should take as much responsibility as women for home and children'. Moreover such views were shared by the (shrinking) proportion of respondents who still believed that women were 'naturally' better at such tasks³. Paradoxically, while second wave feminist thought has often focused on plastic sexuality and its symbolism, the roots of gender change lie in the shrinking significance of its reproductive component. This accounts for what Castells (1997) calls 'the end of patriarchy' although we disagree with the theoretical model which he uses (MacInnes, 2006b) and which crucially, for us, lacks a demographic base.

The privatisation of sexuality

Because it made population replacement so much easier, the third result of the reproductive revolution was that it facilitated the transformation of reproductive sexuality from a public to a private affair, re-defining sexuality as a private matter over which the individual ought to be sovereign. Hitherto sexuality had always been subject to intense forms of social control at both the level of society (both normatively and by the state and church) and at the level of the family. Virtually all known societies segregated the sexes in various ways, distinguished between legitimate and illegitimate offspring and regulated sexuality, both through marriage and the prohibition or penalization of extra-marital sexual relations, non-reproductive forms of sexual activity or contraception and abortion. The expression of sexuality was gradually disconnected from reproduction, and, in Davis's terms, intimacy liberated from 'convention': but rather than causing fertility decline by obliterating society's established reproductive institutions, it was the former that rendered the transformation of the latter possible. Official warnings about the dire medical and moral consequences of abortion, contraception, family limitation or neo-Malthusianism, backed by the force of law, gave way in little more than half a century to campaigns about 'safe sex'.

The mechanisms of social change here are complex. Most legal reform around abortion, contraception, divorce, marriage and family law took place within a discourse of gender and equal rights rather than any direct concern with reproduction or fertility. But it was surely only the prior victory of the reproductive revolution (together with the 'baby boom') that forcibly removed this latter from the political agenda. One need only contrast the hysterical political debate and hostility to all manifestations of 'the woman question' aroused by fear of population decline and its consequences in the first half of the twentieth century in Europe, to the swift and complete victory of second wave feminism in the second half. In a few short decades, the future became female. Spain is an instructive example. Thirty years ago, married women still required their husbands' permission to take employment, obtain a passport or open a bank account. Homosexuality, divorce, contraception and abortion were all illegal. Today, not only are the latter all legal, but same and different sex couples may marry on an equal basis.

Many of these developments have been analysed in terms of a 'second demographic transition' (Cliquet, 1991; Coleman, 2003; Lesthaeghe, 1995; Van de Kaa, 1990, 2002), in which changing norms in the context of greater material affluence and personal autonomy play a key part in the explanation. But, once again, this is to turn things on their head and pay insufficient attention to what made the rise of such new norms and lifestyles possible in the first place. In particular, the collapse of the public regulation of reproductive sexuality and the edifice of patriarchal institutions and norms that supported it, tend to be perceived as the rise of 'selfishness'.

It is often difficult to read the contemporary demographic literature on fertility and social change without gaining an impression of scientific thought struggling to free itself from a profoundly conservative and anachronistic moral worldview. Men's, and above all, women's historically unprecedented freedom to choose whether and when to have children, and within whatever family form, liberated from the moral strictures of church or state regulation of the family and reproductive sexuality, always tends to appear wrapped in swathes of hedonism. If procreation ceases to be a duty, surely the ultimate foundation of social order is fatally threatened. In the long term population must surely decline, in the short term, it might be sustained only by recourse to what may often be seen as a hardly lesser moral threat: large scale immigration.

However this privatisation of reproductive sexuality, and its liberation from the control of reproductive institutions (be they state, church or patriarchal household) has had as its counterpart the inexorable acceptance, for the most part willing, of an unprecedented but largely invisible (at least to some demographers) altruism by parents. As sovereign citizens, competitors in a labour market and authors of their own identities and life courses, it is expressly understood that children owe their parents nothing. The decline of patriarchy cuts both ways: parenthood may be freely chosen, but the children thus born are free, emancipated to pursue their own lives and individual happinesses. Moreover, in contrast to the hedonism of many of the accounts of what intimacy liberated from 'convention' comprises, in which children appear only as an 'inertial drag' on the purity of a relationship (Giddens, 1992), we know two things. People have ever higher aspirations both for their children and for the conditions necessary to rear them adequately, and overwhelming majorities consistently tell social researchers that the family is not only the most important social institution in their lives, but that which affords them most satisfaction.

The forward march of the family

The substitution of the state for the family as the institution which serves as the ultimate guarantor of subsistence and the family's replacement by the labour market as the main institution governing production weakens the family from outside, while inside it is undermined by the increase in the force of liberalism and personal autonomy (de Singly, 1993; Flaquer, 1998). People's status as citizen progressively supplants their status as family member (Mann, 1994). The privatisation of both reproductive and plastic sexuality, the atrophy of gender and reproductive technological innovation may all mean that 'families' become increasingly diverse. Davis assumed they must weaken it: 'sex' was only good for holding 'pairs' together. His comments on women marrying the state might also be seen to presage the family's move towards the centre of

politics, both as an object of population policies and as the institution charged with realising the rapidly expanding social rights of the infant.

However the final, paradoxical, result of the reproductive revolution is that, in complete contrast to Davis' prediction, the family becomes *stronger* in two specific but important senses. The democratisation of longevity and mass maturity leads to the survival at any point in time of more generations within each family. While children may have fewer siblings they have more grandparents. For the first time in history, families comprise mostly the flesh and blood living rather than the fondly remembered and mourned. Second, because reproductive work falls as a proportion of all social effort, labour input per birth can rise. This ranges from the 'invention of childhood' (Ariès, 1973) to what could be called the 'romance' of the family in contemporary accounts (eg Lasch, 1977) analogous to the romance of craftism (eg Braverman, 1974) in the analysis of other forms of labour. While the family is imagined to be hollowed out, deskilled or degraded by the twin forces of state and market, in practice such rhetoric is testimony not only to its increasing significance and power, but also to the unprecedented demands placed upon what it ought to achieve (Donzelot, 1979). Rising rates of cohabitation, separation and divorce may be evidence of the search for a better family, not the rejection of the family as such. It is not the family that industrialism suffocates, but rather its patriarchal form.

While conservatives might follow Davis' prognosis in decrying the decline of the family (Fukuyama, 1999) or lament that it has become a mere 'lifestyle choice' (Morgan, 1995), attribute declining fertility rates to selfish hedonism (Aries, 1980) or the shirking of collective obligations (Myrdal, 1968), diverse families and low fertility constitute really vital (in every sense) *progress*. Family diversity is limited by, and the strength of family obligations maintained by, the power of attachment (Bowlby, 1971; Winnicott, 1965) rooted in the prolonged period of intense neonatal care by adults that infants require until they become reasonably capable of maintaining social relations autonomously (Dinnerstein, 1987). Such care depends heavily upon the long term and stable presence of a small number of individuals, usually the biological parents or close relatives of the infant but not necessarily so. This explains both the universal existence of the family (eg Elshtain, 1982; Goode, 1964), and its wildly heterogeneous social form, as well as serving the analytical function of dividing off a private from a public sphere (MacInnes, 1998).

Diverse families will retain as their distinguishing feature the attempt to maintain stable relations of attachment over time between at least one adult and an infant, and the later legacy of these relations in terms of feelings of love, mutual loyalty and obligation, or indeed, resentment, hostility and alienation. Reproduction can only with great difficulty be 'industrialised', 'commoditised', bureaucratised or otherwise rationalised and undertaken in other social institutions. When this does happen, the results are usually extremely negative (eg the experience of those raised in orphanages or children's homes). Davis' comments on the 'professionalisation' of mothering can be seen as a provo-

cation rather than a prediction. Of course this does not mean that families always perform reproductive work well, or that they are not, sometimes, the site of neglect, abuse, violence or murder of children (Dobash and Dobash, 1992; Kelly and Radford, 1987).

Because sexual reproduction requires the family, but renders its individual components mortal, the family has been the key institution regulating transmission of such individual property as exists. Hence most societies have until now sought to define and regulate legitimacy (Malinowski, 1927; Morgan, 1995). In nineteenth century Britain this could take the form of defining illegitimate sexual relations (that might result in the birth of a child and potential inheritor) as a crime equivalent to theft of property because it put the inheritance of legitimate heirs at risk (Pateman, 1988). Because the reproductive revolution increases the supply of reproductive labour, reduces the demand for it and encourages states to socialise its costs, and along with its sister revolutions undermines the political power of the family in relation to the state, it follows that legitimacy rapidly becomes less important for social status.

From gender to generation

As the reproductive revolution allowed fertility to fall in the most developed states, births first of all became concentrated in the years just after marriage, and later, once family sizes around two become the norm, became 'delayed' occurring later in women's life courses (Frejka y Calot, 2001). It now looks as if this revolution is being complemented by a new phase in which reproductive work not only occurs later within women's life courses, but also across generations, becoming *less concentrated in time across longer lives*. The UK millennium cohort study, for example, found that although only one in twenty babies born in 2000 shared a household with a grandparent, one half of those with working mothers were looked after by grandparents while their mothers were at work, and three out of four were cared for by grandparents at other times. Nor was childcare the only means of grandparental support. One third of mothers and a similar proportion of fathers reported receiving essential material or financial help from their own parents (loans, money or physical capital gifts, domestic equipment, help with housing etc.) in addition to gifts or extras for the baby.⁴ All this was possible because no less than six out of ten babies were born with all four grandparents alive.

Elsewhere we have referred to this redistribution of reproductive work across both the life course and the two sexes as the 'feminisation of old age' (Pérez Díaz, 2003a). However what this redistribution really demonstrates is that what was previously a vital and biologically rooted link between reproductive work, age and sex has been dramatically weakened. The weight of reproduction in the social construction of such characteristics is falling, not because biology or sexuality are merely social constructs (Kessler and

McKenna, 1978; Bock, 1989) but because high reproductive efficiency and low fertility has reduced the relevance of the specifically biological division of labour within sexual reproduction. It is falling not only because there are fewer births but because of the rapid rise in life expectancy, which has generalised the simultaneous survival of three generations, so that for the first time in human history, virtually all infants are not only children but *grand* children. And it is not only grandmothers who have taken on reproductive work, but grandfathers too. As men live longer after retiring earlier, they take on a growing share of reproductive work that was formerly exclusively done by women. Hank and Buber (2007) found that 58% of grandmothers and 49% of grandfathers had undertaken some kind of childcare over the previous year, with over half doing so at least weekly in the ten European countries they studied.

Population 'ageing' or mass maturity

It is well known that demographic systems with low life expectancy and high fertility produce 'young' population pyramids with a wide base. Neither is it news that high life expectancy and low fertility produce 'ageing' pyramids that look more like rectangles. However because both sociology and demography tend to overlook the powerful relationship between fertility and mortality created by the efficiency of the reproductive system, the growth of the share of older generations in the population continues to be seen as an avoidable evil, despite the fact that, as we have seen above, no society that has crossed the threshold of mass survival to old age has responded with anything other than a steep fall in fertility.

Population 'ageing' is a curious way to label one of the greatest modern accomplishments of humankind: the 'democratisation' of the chances of enjoying a long, and lengthening lifespan, together with a reduction in the proportion of that span dedicated to reproductive labour, and especially 'wasted' reproductive labour: an anodyne phrase for what it represents – the emancipation of the vast majority of people both from their own early death or that of one or more of their children. Compared to the ugly fate of those 'populations' condemned to live in states still blighted by war, famine, disease and high child mortality, a fate all the more dreadful because readily avoidable, 'population ageing' is an achievement to be heartily wished for.

The debate on population ageing (eg World Bank, 1994) largely turns upon the assertion that longer lifespans mean an increase in the dependency ratio between those in productive employment and those who are not. However this oxymoronic term rests on a misleading metaphor characterising societies as individuals. Individuals do 'age', bringing an eventual decline in their vital capacities and death. Societies, or 'populations' cannot and do not 'age'. The shape of their age pyramids may change, but ageing is a social as well as biological process, and one of the key results of the increase in the social forces of production has been an increase not just in average life expectancy, but also in

the standard of health and activity of people for any given calendar age. Sir Mick Jagger, for example, might qualify for a bus pass, but remains a sex symbol and active rock star at an age which, a century ago, would probably have rendered him infirm had he been fortunate enough to survive at all. Once again, a longitudinal view can correct a mistaken transversal impression. We cannot determine the future capacities of the elderly by making transversal comparisons across *different generations* with different ages in the population at a point in time. Older people today are vastly different from their counterparts in earlier times of earlier generations. So too will be the elderly of the future.

What matters in dependency ratios is the balance, *over time and across generations*, between the productivity of those who work and the consumption levels of those who do not, as well as the relative size of these two groups. The productivity of the former will continue to increase. The consumption levels of the latter depend *inter alia* on the relative costs of maintaining retired and inactive people versus that of maintaining and educating those who have yet to enter the labour force. Insofar as the debate about population ageing is about concern over worsening 'dependency ratios' as the number of elderly inactive increases it is simply empirically mistaken. As we have seen the elderly take on an increasing amount of reproductive work this facilitates much higher rates of incorporation of prime age women into the labour market, as well as maintaining high rates of male participation despite trends towards equalization in the domestic and childcare sexual division of labour (thus improving rather than worsening dependency ratios). A paradoxical effect of the shift from gender to generation in the distribution of work is therefore that actual dependency ratios (in the sense of the relationship between those doing productive work and those dependent on them) come to have less and less to do with age, or the shape of age pyramids in a given society.

Yet perhaps more important than these effects, is the lack of any simple relationship between dependency and employment status. Young employees may carry heavy burdens of training or mortgage debt. The retired may possess substantial assets accumulated across the life course. And if we learn the key lesson of not drawing longitudinal conclusions from transversal comparisons, we may safely hypothesise that tomorrow's retirees will have accumulated more than today's. Once again we may take Spain as an example, where calculations taking an appropriately longitudinal perspective reveal a very different prospect for dependency ratios than the standard gloomy prognoses. Analysing synthetic cohorts constructed from a quarter century of Labour Force Surveys, Garrido Medina and Chuliá Rodrigo estimate that dependency ratios in Spain will *fall* 40% between 1985 and 2030 (2005 figure 6.2). Blanes *et al.* (1996), also using longitudinal techniques, obtained similar results a decade earlier. Advancing activity rates for women and the fall in young dependents more than make up for the rise in the number of older inactive people and later labour market entry.

There is a well known strong statistical relationship between a state's affluence and the life expectancy of its citizens. Affluence has been assumed to

confer longevity. However the reverse is also important: mass longevity facilitates affluence. How can it be, therefore, that such magnificent social progress comes to be seen as the social sclerosis summoned up by 'population ageing' rhetoric? Let us outline two hypotheses. First such rhetoric is a convenient tool for those seeking rationales to restrict the welfare state, on the grounds that such sclerosis threatens future prosperity. Second, it comprises an unfortunate legacy from social sciences' flirtation with eugenicist ideas (Mackenzie, 1981). From Malthus onwards demography has at times been distorted by an unfortunate tendency to see the right kind of early deaths as, in the long run, not only inevitable but even desirable.

The rise of identity

Only in a world where people assume that reaching one's seventieth or eightieth year in robust health is normal can it make sense to discuss the provenance of threats to such an achievement in terms of 'risk'. The reproductive revolution has thus facilitated what has been theorized as the rise of reflexivity or self-identity (Giddens, 1991). Material affluence and demographic security simultaneously multiply the range of opportunities available to both men and women, or what Dahrendorf (1979) called 'life chances', while raising their opportunity costs. While it increases people's ability in principle to 'plan' across what can be expected to be a much longer life course, rather than resigning themselves to superstition, magic or faith, the mobile, disorientating, extensive and complex nature of this demographically more secure society nevertheless supplies new terrors aplenty to besiege people's sense of existential security (Gellner, 1993: 31–5). Thus, for us, the contrasts made between 'risk' and 'fate' by theorists, such as Beck, Giddens or Lash, turn things on their head. They present what is experienced by most people as *liberation* from the fatal consequences of ignorance, disorder and want, as the socially constructed *domination* of people's lives by necessarily opaque scientific expertise and specialization (Beck, Giddens and Lash, 1994; Giddens, 1991).

The visibility of the reproductive revolution

It might be asked why, if it is so fundamental, the reproductive revolution has gone unrecognised. There are many answers, but let us highlight a methodological one and a substantive one. Sociology (and often demography) prefers transversal (cross-sectional) measures and analyses, particularly where immediate policy relevance is sought. However, since such measures inevitably combine the experience of successive generations, which come to appear as characteristics of different age groups at a given point in time, they obscure processes involved in the reproduction of society over time. Instead of representing tremendous social progress, low fertility and mortality come to appear

respectively as a deficit of births and surfeit of dependent elderly. By contrast the reproductive revolution, mass maturity and reproduction of society over time are only clearly visible using longitudinal measures. This problem is aggravated by the tendency to imagine societies (plural) as essentially discrete, two-dimensional structures⁵ whose essential characteristics may be captured by the social survey or census, and which change over time as they move up or down history as coherent units (Anderson, 1991: 33). On the contrary we wish to emphasise the significance of mortal biographies and generational and life course change within a human society that spills across both state frontiers and time periods.

The second reason is that the nature of the reproductive revolution itself tends to render its results less visible. Not only is it an unplanned and unconscious process at the social level (although the individual level may be a very different matter); the material affluence and increased individual autonomy it helps to create minimises its visibility by presenting reproductive behaviour that was formerly a virtually unavoidable collective obligation as a matter of apparently onerous personal choice. This yields the paradoxical result that is key to any adequate understanding of current fertility trends in affluent societies. Just at that point in human history where the efficiency of sexual reproduction has been revolutionised, and the social controls on sexuality have all but disappeared, it comes to *appear* as something that has become so much more costly that it is only possible to maintain at all if an ever greater share of its burden is assumed by the state. The essence of this paradox is that the victory of the reproductive revolution becomes so absolute that it falls prey to social amnesia. Only societies whose reproduction is assured can afford the luxury of thinking in terms of the 'opportunity costs' of children, or indeed any substantial personal input to reproductive decision-making at all.

Conclusions

We are clearly making a bold claim when we argue that reproductive change has not only been revolutionary, but of such overarching significance as to compare with the other two, generally acknowledged, revolutions fundamental to the rise of modern society (Hobsbawm, 1962). However, this demographic change can be seen neither as a 'cause' nor 'effect' of other, analytically distinct, social change. Only by appreciating the interconnected nature of change within the demographic and other arenas can the rise of modernity be understood. Moreover, in developing what might be thought of as a sociology of reproduction, we do *not* mean a sociology of the social context *within which* reproduction (understood in terms of other dynamics) takes place. On the contrary, it is part of our argument that the failure to take sufficient account of the sexual genesis of human beings, and therefore of the social significance of the unique demographic change represented by the reproductive revolution, has been a key theoretical weakness of contemporary

sociology in contrast to the interest Davis originally pursued. His focus on reproductive institutions is a useful corrective to 'over-socialised' approaches to individuals (Wrong, 1961).

This article has suggested a new concept for understanding the nature of demographic change in modern societies, arguing that adopting a longitudinal rather than transversal perspective reveals the existence of a one-off change in the efficiency of the reproductive system (considered in its simplest form as the relation of the number of births per woman to population level) which has been fundamental to the rise of modernity. It has argued that recognising this has profound implications for how we view such issues as declining fertility, population ageing, the evolution of the family, the role of the state, gender change and the distribution of work (both productive and reproductive, paid and unpaid) across the life course and between men and women. We believe it also has an important role to play in many other debates, such as the progressive deregulation of sexuality (including the legalisation of homosexual marriage); the sociology of age and the life course; the evolution of the intergenerational transfer of wealth and other forms of capital (and the competition between the state and the family to control it); the economics of time and that whole tradition of sociology that seeks to establish links between modernisation, broadly conceived, secularisation and changing values.

Enduring revolutions are about change that is not only rapid but popular, not only because it affects the mass of the population, but because they are its protagonists. Rather, people have found ways to emancipate themselves from the demographic straitjacket of the past, discovering in turn, that such emancipation opens up for them hitherto unimagined freedom of manoeuvre in their lives, including the freedom to devote more time and resources to the rearing of their children within a much longer lifespan, or, alternatively, the freedom to delay becoming a parent till an age they would in earlier centuries have been lucky to survive to, or again to avoid becoming a parent at all. In affluent states life may still be solitary, poor, nasty or brutish at times, but it is very rarely short.

The reproductive revolution is also a global one. Unfortunately, the geopolitics of demography has at times tended to focus concern on lowering fertility in the developing world rather than tackling mortality. While affluent states express widespread concern about their 'low' fertility and population ageing, much of the world's population still lives in states where infant mortality is above levels that European states left behind a century ago, and the AIDS epidemic has reversed the slow rise of life expectancy in sub-Saharan Africa. At a global level, there is no shortage of births. Because the reproductive revolution remains incomplete, there is still an awful, and avoidable, surfeit of early deaths.

Notes

- 1 Authors' analysis, Centre for Longitudinal Studies (2004). This understates the demographic change in that a proportion of grandparents are alive but not definitely known to be so by their children.
- 2 Authors' analysis Central Intelligence Agency (2008), using July 2007 population estimates.
- 3 Authors' analysis International Social Survey Programme (2004) and Jowell, R and the Central Co-ordinating Team (2005).
- 4 Authors' analysis Centre for Longitudinal Studies (2004).
- 5 Visualised, for example, in terms of a dataset or as members of a 'population' distributed along the x-axis and their various characteristics plotted on a series of Y-axes.

References

- Anderson, B., (1991), *Imagined Communities*, London: Verso.
- Ariès, P., (1973), *L'enfant et la vie familiale sous l'Ancien Régime*, Paris: Seuil.
- Aries, P., (1980), 'Two successive motivations for the declining birth rate in the West', *Population and Development Review*, 6: 645–650.
- Baumol, W.J., (1967), 'Macroeconomics of unbalanced growth: the anatomy of urban crisis', *The American Economic Review*, 157: 415–426.
- Beck, U., Giddens, A. and Lash, S., (1994), *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order*, Cambridge: Polity.
- Becker, G.S., (1965), 'A Theory of the Allocation of Time', *The Economic Journal*, 75: 493–587.
- Becker, G.S., (1991), *A Treatise on the Family*, Cambridge, Mass.: Harvard University Press.
- Bell, F.C. and Miller, M.L., (2005), *Life Tables for the United States Social Security Area 1900–2100*, Actuarial Study No. 120. Baltimore: Office of the Chief Actuary, Social Security Administration.
- Bertalanffy, L., (v 1950), 'The theory of open systems in physics and biology', *Science*, 111: 23–29.
- Blanes, A., Gil, F. and Pérez, J., (1996), *Población y actividad en España: evolución y perspectivas, Colección Estudios e Informes Número 5*. Barcelona: Caja de Ahorros y Pensiones de Barcelona.
- Bock, G., (1989), 'Women's History and Gender History: Aspects of an International Debate', *Gender and History*, 1 (1): 7–30.
- Bongaarts, J., (2007), 'How Long Will We Live?' *Population and Development Review*, 32: 605–628.
- Bowlby, J., (1971), *Attachment and Loss, Vol. 1: Attachment*. Harmondsworth: Penguin.
- Braverman, H., (1974), *Labor and Monopoly Capital*. New York: Monthly Review Press.
- Cabré Pla, A., (1999), *El sistema català de reproducció. Cent anys de singularitat demogràfica*, Barcelona: Edicions Proa.
- Caldwell, J.C., (1982), *Theory of Fertility Decline*, London: Academic Press.
- Castells, M., (1997), *The Power of Identity*, Oxford: Blackwell.
- Central Intelligence Agency, (2008), *The 2008 World Factbook*. <https://www.cia.gov/library/publications/the-world-factbook/> (accessed 20/5/2008).
- Centre for Longitudinal Studies, (2004), 'Millennium Cohort Study First Survey 2001–2003[computer file] 2nd Edition. February. SN: 4683. University of London. Institute of Education'. Colchester, Essex: UK Data Archive [distributor].
- Charles, E., (1934), *The Twilight of Parenthood*, London: Watts and Co.
- Cleland, J., (2001), 'The Effects of Improved Survival on Fertility: A Reassessment', in *Population and Development Review*, 27: 60–92.
- Cleland, J. and Wilson, C., (1987), 'Demand Theories of the Fertility Transition: An Iconoclastic View', *Population Studies*, 41: 5–30.
- Cliquet, Robert V., (1991), 'The second demographic transition: fact or fiction', in *Populations Studies*, Strasbourg: Council of Europe.

- Coale, A.J., (1986), 'The Decline of Fertility in Europe since the Eighteenth Century As a Chapter in Demographic History', 1–30 in *The Decline of Fertility in Europe: The Revised Proceedings of a Conference on the Princeton European Fertility Project*, Princeton, N.J.: Princeton University Press.
- Coale, A.J. and Cotts Watkins, S., (eds), (1986), *The Decline of Fertility in Europe: The Revised Proceedings of a Conference on the Princeton Fertility Project*, Princeton: Princeton University Press.
- Coleman, David, (2003), 'Why we don't have to believe without doubting in the "Second Demographic Transition": Some agnostic comments', paper to the European Population Conference, Warsaw 2003.
- Connell, Robert W., (2002), *Gender*, Cambridge and Oxford: Polity Press in association with Blackwell Publishers Ltd.
- Cowgill, U.M., (1970), 'The people of York, 1538–1812', *Scientific American*, v.223: 104–110.
- Dahrendorf, Ralf, (1979), *Life Chances*, Chicago: Chicago University Press.
- Davis, K., (1937), 'Reproductive Institutions and the Pressure for Population', *The Sociological Review*, XXIX: 284–306.
- Davis, K., (1945), 'The World Demographic Transition', in *The Annals of the American Academy of Political and Social Sciences*, 237: 1–11.
- de Singly, François, (1993), *Sociologie de la famille contemporaine*, Paris: Nathan.
- Dinnerstein, Dorothy, (1987), *The Rocking of the Cradle and the Ruling of the World*, London: Women's Press.
- Dobash, R.E. and Dobash, R.P., (1992), *Women, Violence and Social Change*, London: Routledge.
- Donzelot, J., (1979), *La policía de las familias*, Valencia.: Pre-Textos.
- Elshtain, J.B., (ed.), (1982), *The Family in Political Thought*, Brighton: Harvester.
- Frejka, T. y Calot, G., (2001), 'Cohort childbearing age patterns in low-fertility countries in the late 20th century: Is the postponement of births an inherent element?' *Working papers of the Max Planck Institute for Demographic Research* (MPIDR WORKING PAPER WP 2001-2009).
- Flaquer, L., (1998), *El Destino de la Familia*, Barcelona: Editorial Ariel, S. A.
- Fukuyama, F., (1999), *The Great Disruption*, Profile Books: London.
- Garrido Medina, L. and Chuliá Rodrigo, E., (2005), *Ocupación, Formación y el Futuro de la Jubilación en España, Colección Estudios Número 173*. Madrid: Consejo Económico y Social.
- Gershuny, J.I., (1992), 'Change in the Domestic Division of labour in the UK, 1975–87: dependent labour versus adaptive partnership', in *Social Change in Contemporary Britain*, edited by Abercrombie, N. and Warde, A. Cambridge: Polity Press.
- Gellner, E., (1993), *The Psychoanalytic Movement*, second edition, London: Fontana.
- Giddens, A., (1992), *The Transformation of Intimacy: Love Sexuality and Eroticism in Modern Societies*, Cambridge: Polity.
- Giddens, A., (1991), *Modernity and Self Identity*, Cambridge: Polity.
- Gil Calvo, E., (1991), *La Mujer Cuartecada*, Barcelona: Anagrama.
- Goode, W.J., (1964), *The Family*, Englewood Cliffs, New Jersey: Prentice-Hall.
- Hank, K. and Buber, I., (2007), 'Grandparents Caring for Their Grandchildren: Findings from the 2004 Survey of Health, Ageing and Retirement in Europe', Mannheim Research Institute for the Economics of Ageing Working Paper 127.
- Henry, L., (1965), 'Reflexions sur les taux de reproduction', *Population*: 53–76.
- Hodgson, D., (1983), 'Demography as social science and policy science', *Population and Development Review*, 9: 1–34.
- Hodgson, D., (1988), 'Orthodoxy and revisionism in American demography', *Population and Development Review* 14: 541–569.
- Human Mortality Database, University of California, Berkeley (USA), and Max Planck Institute for Demographic Research (Germany), available at www.mortality.org or www.humanmortality.de (data downloaded on 2 April 2008).
- Hobsbawm, E.J., (1962), *The Age of Revolution: Europe 1789–1848*, London: Weidenfeld and Nicholson.

- International Social Survey Programme, (2004), 'Family and Changing Gender Roles III, 2002. [computer file] 1st edition, ZA3880;UK Data Archive SN5018', Köln: Zentralarchiv Für Empirische Sozialforschung, Colchester, Essex: UK Data Archive[distributor].
- Jowell, R. and the Central Co-ordinating Team, (2005), European Social Survey 2004: Technical Report, London: Centre for Comparative Social Surveys, City University. European Social Survey Round 2 2005 [computer file], first edition, Norwegian Social Science Data Services [supplier].
- Kelly, E. and Radford, J., (1987), 'The Problem of Men: Feminist Perspectives on Sexual Violence', in *Law, Order and the Authoritarian State*, edited by Phil, Scraton, Buckingham: Open University Press.
- Kessler, S.J. and McKenna, W., (1978), *Gender an Ethnomethodological Approach*, New York: Wiley.
- Kirk, D., (1944), 'Population Changes and the Postwar world', *American Sociological Review*, 9 (1): 28–35.
- Landry, A., (1934), *La Révolution Démographique*, Paris: Librairie Sirey.
- Lasch, C., (1977), *Haven in a Heartless World: The Family Besieged*, New York: W.W. Norton and Co.
- Lesthaeghe, R., (1995), 'The Second Demographic Transition in Western Countries: An Interpretation', Mason, K. and Jensen A-M. *Gender and Family Change in Industrialized Countries*, Oxford, Clarendon Press.
- Linder, S.B., (1970), *The Harried Leisure Class*, New York: Columbia University Press.
- Livi Bacci, M., (2001), *A Concise History of World Population* (3rd edition, Oxford: Blackwell.
- MacInnes, J., (1998), *The End of Masculinity*, Buckingham: Open University Press.
- MacInnes, J., (2006a), 'Work-life balance in Europe: a response to the baby bust or reward for the baby boomers?' *European Societies*, 8 (2): 223–249.
- MacInnes, J., (2006b), 'Castells' Catalan routes: nationalism and the sociology of identity', *British Journal of Sociology*, 57 (4): 677–698.
- MacInnes, J. and Pérez Díaz, J., (2009), 'Demography', in Turner, B.S. (ed.), *The New Blackwell Companion to Social Theory*, Oxford: Blackwell.
- Mackenzie, D., (1981), *Statistics in Britain, 1865–1930: The Social Construction of Scientific Knowledge*, Edinburgh: Edinburgh University Press.
- Malinowski, B., (1927), *Sex and Repression in Savage Society*, London: Paul, Trench, Trubner.
- Mann, M., (1994), 'Persons, Households, Families, Lineages, Genders, Classes and Nations', 177–194 in *The Polity Reader in Gender Studies*, Cambridge: Polity Press.
- Meillassoux, C., (1981), *Maidens, Meal, and Money: Capitalism and the Domestic Community*, Cambridge: Cambridge University Press.
- Morgan, P., (1995), *Farewell to the Family?* London: IEA Health and Welfare Unit.
- Myrdal, A., (1968) [1939], *Nation and Family*, Cambridge Mass.: M.I.T Press.
- Notestein, F.W., (1945), 'Population – The long view,' in Schultz, Theodore William (ed.), *Food For the World*, Chicago: University of Chicago Press: 36–57.
- Notestein, F.W., (1953), 'Economic Problems of Population Change', in *Proceedings of the Eighth International Conference of Agricultural Economists*: 13–31, New York: Oxford University Press.
- Olshansky, S.J., Carnes, B.A. and Cassel, C., (1990), 'In search of Mathuselah: estimating the upper limits to human longevity', *Science*, 250: 634–640.
- Omran, A.R., (1971), 'The Epidemiologic Transition: A Theory of the Epidemiology of Population Change', in *The Milbank Memorial Fund Quarterly*, 49 (4): 509–538.
- Parsons, T., (1956), 'The American Family: Its Relations to Personality and to the Social Structure', in *Family socialization and interaction processes*, edited by Talcott, Parsons and Robert F. Bales London: Routledge and Kegan Paul.
- Pateman, C., (1988), *The Sexual Contract*, Cambridge: Polity.
- Pérez Díaz, J., (2001), *Transformaciones sociodemográficas en los recorridos hacia la madurez, Las generaciones españolas 1906–1945*. Tesis doctoral. Madrid: UNED.

- Pérez Díaz, J., (2003a), 'Feminización de la vejez y Estado del Bienestar en España', *Revista Española de Investigaciones Sociológicas*, 104: 91–122.
- Pérez Díaz, J., (2003b), *La Madurez de Masas*, Madrid: IMSERSO.
- Pérez Díaz, J. and MacInnes, J., (2008), 'La tercera revolución de la modernidad: la reproductiva', *Revista Española de Investigaciones Sociológicas*, 122: 89–118.
- Robinson, W.C., (1997), 'The Economic Theory of Fertility Decline Over Three Decades', *Population Studies*, 51: 63–74.
- Rubin, G., (1977), 'The traffic in women: Notes on the political economy of sex', in *Towards an Anthropology of Women*, edited by Reiter, R.R. New York: Monthly Review Press.
- Szreter, S., (1993), 'The Idea of Demographic Transition and the Study of Fertility Change: A Critical Intellectual History', *Population and Development Review*, 19: 659–702.
- Szreter, S., (1996), *Fertility, Class and Gender in Britain, 1860–1940*, Cambridge: Cambridge University Press.
- Teitelbaum, M.S. and Winter, J.M., (1985), *The Fear of Population Decline*, Orlando, Florida, Academic Press.
- Titmuss, R.M. and Titmuss, K., (1942), *Parents Revolt. A Study of the Declining Birth Rate in Acquisitive Societies*, London: Secker and Warburg.
- Vallin, J. and Meslé, F., nd, *Tables De Mortalité Françaises 1806–1997 et Projections Jusqu'en 2102*. Paris, INED.
- Van de Kaa, D.J., (1987), 'Europe's Second Demographic Transition', *Population Bulletin*, 42 (1) (Washington D.C.: Population Reference Bureau).
- Van de Kaa, D.J., (1990), 'The second demographic transition revisited: Theories and expectations', in *Population Change and European Society*, Florencia: European University Institute.
- Van de Kaa, D.J., (2002), 'The idea of a second demographic transition in industrialized countries', paper presented to Sixth Welfare Policy Seminar of the National Institute of Population and Social Security, Tokyo, Japan, 29th January.
- Wilmoth, J.R., (1997), 'In Search of Limits', 38–64 in *Between Zeus and the Salmon: The Biodemography of Longevity*, edited by Wachter, K.W. and Finch, C.E. Washington, DC: National Academy Press.
- Wilmoth, J.R. y Horiuchi, S., (1999), 'Rectangularization Revisited: Variability of Age of Death Within Human Populations', in *Demography*, 36 (4): 475–496.
- Wilmoth, J.R., Deegan, L.J., Lundstrom, H. and Horiuchi, S., (2000), 'Increase of maximum life-span in Sweden, 1861–1999', *Science*, 289: 2366–2368.
- Winnicott, D.W., (1965), *The Maturation Processes and the Facilitating Environment*, London: Hogarth Press.
- World Bank, (1994), *Envejecimiento sin crisis. Políticas para la protección de los ancianos y la promoción del crecimiento*, Washington D.C.: World Bank.
- Wrong, D., (1961), 'The oversocialized conception of man in modern sociology', *American Sociological Review*, 26: 183–193.