The Future of American Fertility

Samuel H. Preston
Caroline R. Sten
University of Pennsylvania

This research was supported by the U.S. Social Security Adminstration through grant #10-P-98363-1-04 to the National Bureau of Economic Research as part of the SSA Retirement Research Consortium. The findings and conclusions expressed are solely those of the authors and do not represent the views of SSA, any agency of the Federal Government, or the NBER.

The level of fertility in a population is the principal determinant of the shape of its age structure, which in turn is a critical factor in the terms of trade within a pay-as-you-go system of public pensions. Fertility has fallen below the replacement level of 2.08 children per woman in all developed countries. Partly because of its age structural consequences, a majority of governments in these countries now respond to United Nations questionnaires by saying that their fertility is "too low" (Kohler et al. 2006).

This paper reviews the major factors that appear to be affecting fertility levels in the United States, with an eye towards making defensible statements about future directions of fertility. The subject covers a vast disciplinary range including demography, economics, sociology, public health, reproductive biology, evolutionary biology, political science, and psychology. These disciplines have not produced a widely-accepted framework for analyzing the determinants of fertility at the level of a population. At various times, low fertility has been blamed on affluence and on economic downturns; on hedonic individualism and on archaic family values; on women's economic independence and on women's adherence to traditional roles. In the absence of powerful and successful theory, we will pursue an eclectic, inductive approach, surveying the landscape of fertility variation in search of clues about its principal drivers.

Why Do People Have Children in the Twenty-First Century?

It is useful to begin with this provocative question first posed by Morgan and King (2001). If there were no compelling answer to the question, we would have to confront the possibility that levels of fertility will approach zero. Clearly, the answer to the question does not lie in the domain of economics, since children are very costly and probably always have been. Early suggestions that children were a net economic asset in hunter-gatherer or subsistence economies have been shown to be inaccurate, although their greater contribution to the family economy in such circumstance reduced their net costs relative to the present (Kaplan, 1994).

Sociologists have usefully distinguished between childbearing aimed at satisfying social expectations and childbearing aimed at self-fulfillment. Thornton and Young-DeMarco's (2001) review of trends in attitudes about one's own childbearing and that of others shows a huge reduction during the 1960s and 1970s in the degree of "oughtness"

regarding fertility. While the desire to satisfy social expectations has not disappeared, people began to perceive less social pressure to bear children and to have less rigid expectations of others' performance. Increasingly, people justified childbearing in terms of its impact on their personal well-being, satisfaction, and happiness.

It would be surprising if the personal rewards from childbearing did not have a deep evolutionary basis imprinted in human biology. Recent investigations in psychology help to clarify the nature of these rewards. Bartels and Zeki (2004) use fMRI imaging to measure brain activity in mothers when they viewed pictures of their own children and those of acquainted children and adults.[1] Pictures of their own children, but not of others, activated regions of the brain rich in oxytocin and vasopressin receptors-neurohormones associated with pair-bonding- while deactivating regions associated with negative emotions and social judgment. Animal studies confirm the central role of oxytocin and vasopressin in attachment and bonding (Carter et al., 2003).

Mothers are aware of the intense emotions evoked by their children. "The Motherhood Study", a nationally representative telephone survey of 2,009 mothers, found that 93% agreed with the statement that "I have an overwhelming love for my children unlike anything I feel for anyone else." 81% said that they were very satisfied with their life as a mother and an equal percentage agreed that "being a mother is the most important thing that I do." (Erickson and Aird 2005). The rewards of parenthood--presumably social as well as emotional-- are visible to high school seniors, three quarters of whom believe that motherhood and fatherhood will be fulfilling. Between 1976-77 and 1997-98, the percentage so reporting rose by 11 points for women and 7 points for men (Thornton and Young-DeMarco 2001).

It is possible that the rewards of childbearing are not fully appreciated until one has a child. One study reports that mothers in fact did not anticipate how completely they would fall in love with their offspring (McMahon 1995), which raises the possibility that the motivations for having the first child are systematically different from those of subsequent children. An interesting study in Bulgaria (Buhler 2006) demonstrated that the principal attitudes predictive of having a first child were beliefs that it would strengthen relations with partner and parents, whereas the principal attitude predictive of

[1] To date, there have been no equivalent studies of fathers.

a second child for both men and women was the perception that it would bring "increased joy and satisfaction in life." What is clear is that few American parents stop at one child. Among women aged 40-44 in 2004, 78.4% of those who had had at least one child had continued to the second (US Census Bureau 2005a).

Recent Trends in American Fertility

The most common measure of fertility is the period total fertility rate (TFR), which indicates how many children would be born to a woman who survived to the end of her reproductive years and experienced at each age the observed age-specific fertility rate of a particular period. The level of the total fertility rate that allows each generation to replace itself exactly is approximately 2.08 children per woman. Figure 1 shows the value of the TFR in the United States since 1928. With virtually no interruption except the post-World War II baby boom, the TFR fell continuously from 1820 to 1975. Since 1989 it has remained in the narrow range of 1.98 to 2.08. Figure 1 also shows the average number of children ever born to cohorts who completed their childbearing and were aged 26 during the year shown on the x axis.[2] Clearly, there has been less volatility in the completed family sizes of actual cohorts than in the period measures based on synthetic cohorts. This relation is also evident in Europe (Bongaarts 2002).

The period TFR is usefully considered to consist of a volume component, measuring the completed family sizes of cohorts then bearing children, and a timing component, indicating when in the course of their lives the cohorts will bear their children. During a period when ages at childbearing are growing older, the period TFR will be systematically lower than the TFR of relevant cohorts because of a "thinning out" of lifetime cohort births.[3] Based upon age-specific rates of childbearing provided by the National Center for Health Statistics, the mean age at childbirth in the US has risen fairly steadily from 26.00 in 1980 to 27.90 in 2005. Using an adjustment formula developed by Ryder, this delay has reduced period total fertility rates in the US during this period by about 0.15 children per woman. A more elaborate procedure developed by Bongaarts and

[2] The completed family size of a cohort would be identical to the TFR of the cohort if there were no differential fertility by mortality or migration.

[3] In the extreme, imagine that the cohort born in 1970 had all of its births at age 29.0 and the cohort born in 1971 had all of its births at age 30.0. In 2000, there would be no births at all. This deficit in period rates would not be offset by a subsequent surplus unless ages at childbearing eventually became younger again.

Feeney produces a similar reduction averaging 0.14 children per woman over the period 1980-1997 (Schoen, 2004). Faster delays in Europe have had a slightly bigger impact on period fertility levels there, averaging 0.26 in 18 countries over the period 1990-97 (Bongaarts 2002). So the volume components of European and American fertility levels are somewhat more similar than would appear from period TFR measures.

The decline in American fertility is reflected in changes in the distribution of parities (the number of children a woman has born) among women who have completed childbearing. Figure 2 shows that parity two has become the favored destination for women, while parities zero and one have grown steadily in popularity; families of three have become somewhat less common, and families of four or more children have fallen precipitously from being the most popular in 1976 (among mothers of the baby boom) to the least popular in 2002.

Bearing children is subject to disturbances that can raise or lower the number of births relative to intentions or expectations. Morgan (2003) finds that only 38% of women aged 22 in the National Longitudinal Study of Youth in 1982 had realized their stated intended parity by age 40. A common form of interference is contraceptive failure, which includes failure to use contraception when no conception is wanted. By European standards, Americans have an unusually high incidence of unwanted or mistimed births. 14% of births during the period 1997-2002 were retrospectively classified as "unwanted" (i.e. not wanted at any time in the future) at the time of conception by their mother and 21% were mistimed (US National Center for Health Statistics 2005a). While a mistimed birth will not necessarily increase a woman's parity above her intentions, an unwanted birth will. 34% of births to women who had not completed high school were classified as unwanted or mistimed by at least two years, compared to only 8% among women who had completed college. The high incidence of unwanted and mistimed births is somewhat surprising in view of the legality of abortion. However, abortion may not be readily available, may be expensive, or may violate personal moral codes.

One factor that can cause fertility to fall short of intentions is subfecundity. 7.4% of married women aged 15-44 in 2002 were classified as infertile: not practicing contraception and not becoming pregnant for at least one year (Ibid.) Separation from a partner may also cause women to fall short of childbearing expectations (Quesnal-Vallee

and Morgan, 2003). The balance of forces resulted in slightly fewer births than expected by respondents in the National Longitudinal Survey of Youth; women who began childbearing late were particularly likely to fall short of targets expressed at an earlier age. Falling somewhat short is the typical but not universal cohort pattern (US Census Bureau 2000a; Hagewen and Morgan, 2005)

Women, Men, Partnerships, and Children

By long-standing traditions supported by powerful social norms, childbearing and childrearing occurred within marriage. The connection between marriage and childbearing is becoming more tenuous:

- 37% of births in 2005 were out-of-wedlock, compared to 5% in 1960 and 18% in 1980 (US National Center for Health Statistics 2006a; US Bureau of the Census 1979).

- fewer than half of American children aged 15 live with both natural parents (Kiernan, 2004).

- 60% of first births conceived before marriage in 1960-64 were "resolved" by marriage, compared to 23% in 1990-94 (Ventura and Bachrach 2000).

- two-thirds of adults disagree with the statement that children are the main rationale for marriage (Thornton and Young-DeMarco 2001).

In short, marriage has become less important as a sanctioning device for childbearing and childrearing, as well as for sexual expression and living arrangements (Thornton and Young-DeMarco 2001). And marriage itself is changing as husbands and wives are becoming more similar in their activities. Married women are spending less time doing housework while their husbands are spending more time (Bianchi, 2000). 68.5% of married women aged 25-34 participated in the labor force in 2003, compared to 38.8% in 1970 (US Census Bureau 2005b). Signaling greater independence of decisions within the family, a married woman's labor force participation has become more responsive to her own potential wage and less responsive to that of her husband (Blau 1998). It has also become less responsive to the presence and ages of her children. The labor force participation rate of women with a child under age one rose from 31% in 1976 to 55% in 2004 (US Census Bureau 2005a).

It is plausible to argue that the decline in marriage as a social institution and the changes that are occurring within marriage during the last four decades have the same basic sources: greater economic opportunities for women and vastly improved means of contraception (Lundberg and Pollak, 2007). Both have given women more power in their lives and in their relationships. The advent of the pill and the IUD in the early 1960's provided methods that were highly effective in preventing pregnancy, in part because they were independent of any particular act of intercourse and thus required less cooperation from a partner. Marriage became less essential as a framework for sexual expression. Furthermore, women could invest in their education and in their careers with less threat of disruption from an unwanted pregnancy whether inside a marriage or out (Goldin and Katz 2002). Such investment was also encouraged by the rise in divorce.

If the rise in women's labor force participation had originated exclusively in a supply shift-- resulting, for example, from improved contraception-- it is likely that women's wages would have declined relative to men's. Instead, the median earnings of women working full-time year-round rose from 61% of men's in 1960 to 77% in 2005 (US Census Bureau 2007b). An important factor in the increase in women's participation and relative wages is probably the rise of service industries in which productivity is not associated with physical strength. Changing norms relating to equity and inequality were probably important as well. The increase in women's labor force participation would not have been as great had they not been able to find acceptable care for their children, and had they not believed that their children were not damaged by such care (Rindfuss et al. 2003).

As Gary Becker (1981) foresaw, the "gains from trade" in the conventional breadwinner/homemaker marriage eroded as women's opportunities outside the home became more similar to those of men. What was less foreseeable was that fertility would level off and even rise modestly as the institution of marriage was fundamentally changing. Had bearing children not been a powerful goal of most American women, they would have found ample reason to avoid them by virtue of their increasingly tattered and tentative relationships, the growing dilemmas of combining children and jobs, and the increased "costs" of raising children under standards of growing affluence. Instead, they

took advantage of their new powers to maintain a fertility level that is the envy of most other developed countries.

Individual-level Characteristics Associated with Fertility in the United States

In this section, we examine fertility variation according to major personal characteristics in order to seek some guidance about future fertility levels. We focus on two variables whose distributions are expected to change in predictable ways and that might therefore shed light on the future of fertility.

One of these variables is women's educational attainment, which has been shown to be negatively associated with fertility in many societies, including historically in the US (Yu 2006, Billari and Philipov 2004, Jones and Tertlit 2006). Prominent interpretations of this negative relationship are that better educated women have a higher opportunity cost of time and are better contraceptors. Table 1 presents the (virtually) completed family sizes of women aged 40-44 in National Surveys of Family Growth (NSFG) from 1973 to 2004.[4] Fertility has fallen by approximately one child per woman in three of the four educational classes and by 0.8 children among high school graduates.

More contemporary evidence can be generated by including younger women and their expected additional births. Table 2 is based upon women aged 30-44 in these same NSFGs. It presents the coefficients relating years of completed schooling to children ever born; to additional births expected; and to the sum of these two, which we term "total births expected". We use OLS regression, which has the convenient property that coefficients in the first two regressions add up to that in the third. We control a woman's age using a second-degree polynomial. For total births expected, the coefficient of a woman's years of schooling declined from -0.153 to -0.126 to -0.097 over this period. Schooling became less influential in fertility despite the fact that educational differentials in women's earnings became much steeper (Blau 1998). The reduction in the coefficient is entirely attributable to the number of additional births expected; the effect of educational attainment on the number of births that had already occurred to women

[4] The 1973 NSFG was applied only to ever-married women. Approximately 5.7% of the cohort was never-married at age 40-44 (US Bureau of the Census 1972:104). This percentage varies from 4.5% for high-school graduates to 11.2% for college graduates. Conclusions would not be materially altered if these women and their relatively low levels of fertility could be included.

remained very stable at -0.150 to -0.163. In other words, better educated women have consistently borne fewer children by their 30s and 40s, but they increasingly expect to catch up before childbearing ends. They are likely to do so, but not to the extent that they expect.

In 2002 for the first time, the NSFG was administered to men. Using the same format employed for women, Table 2 shows that the male coefficient of "total births expected" on education is only -0.053 in 2002, about half of that for women. An obvious interpretation of the sex difference is that men do not bear as much of the time costs of children as women do. Thus, the trade-off between earnings, which rise with education, and parenting is less acute for men (Schultz 1994). According to Table 2, the sex difference is manifest not in additional births expected but in achieved fertility, which is substantially less influenced by educational attainment for men than it is for women.

The regressions do not include any adjustment for marital status. We have argued that the increasing independence and power of women has made marital status less relevant to childbearing. Nevertheless, the large majority of births continue to occur within marriage and the ability of women and men to find suitable marriage partners is doubtless a factor in fertility levels. It is noteworthy in this context that the 2002 coefficients on education are scarcely changed when current marital status is introduced: -0.097 for women remains -0.097 and -0.053 for men becomes -0.059.[5] It is not essential to introduce marital status factors in order to study the relation between educational attainment and fertility, a finding also reported in Australia (Yu, 2006).

A second major characteristic associated with variation in American fertility is ethnicity. High levels of immigration in recent years have left their mark on the fertility of a population already distinguished by longstanding black/white divisions. Table 3 presents the total fertility rates of major ethnic groups in the recent past.[6] The table shows

[5] The categories are never married/not cohabiting, married, cohabiting, and widowed/separated/divorced.
[6] Numerators are derived from birth certificates and denominators from census estimates. The ethnic classification is not strictly comparable in the two sources and the National Center for Health Statistics (2006b) has attempted to bridge the divide. Furthermore, it is likely that the reporting of births is more complete for Hispanics than the estimates of populations. A substantial proportion of Hispanics are illegal immigrants and would not want to be reported to census authorities, whereas they have an incentive to have their births reported. Thus, the figures in Table 3 may be overestimated for Hispanics. Weak support for this suggestion comes from the 2004 Current Population Survey, wherein Hispanic women aged 40-44 reported only 2.30 births, on average [US Census Bureau 2005a]. On the other hand, the number of births reported in the CPS are clearly deficient and especially so for out-of-wedlock births to Hispanics

that the fertility of non-Hispanic whites has been stable or has risen slightly during the past 16 years. The TFR of non-Hispanic whites in the United States would rank in a tie for second highest among developed countries, behind France (see below). So it is not correct to attribute the relatively high level of US fertility exclusively to high fertility among ethnic minorities (and many European countries themselves have sizeable high-fertility ethnic minorities). In fact, the fertility of blacks has fallen sharply and is now below the national average. Hispanic fertility has been roughly level over this period.

The individual-level data files from NSFG enable us to investigate several additional questions about the relationship between ethnicity and fertility. Table 4 presents ethnic differentials in fertility among women aged 30-44, controlling age and years of school completed, over the period 1973 to 2002. It is clear that ethnic differentials in fertility persist when education is controlled. Over the 29-year period, the differential between blacks and whites contracted sharply while the differential between Hispanics and non-Hispanic whites expanded. In both cases, the trend in the differential is primarily attributable to changes in the number of births that have already occurred rather than to those that are expected in the future.

What accounts for the trend towards increasing fertility differences between Hispanics and non-Hispanics? The major factor is the changing composition of the Hispanic population itself. Cubans and Puerto Ricans, who made up a larger share of the Hispanic population in the past, have relatively low fertility levels (TFRs of 1.733 and 2.057, respectively, in 2004). In contrast, Mexican women had a TFR of 3.021 (US National Center for Health Statistics 2006b). Mexicans contributed 61% of Hispanics births in 1989 and 72% in 2004.The Mexican/non-Mexican differences reflect fertility differences in country of origin, as well as in length of time spent in the United States. It is unlikely that a widening of Hispanic/non-Hispanic fertility differences will continue. Mexicans are already a high percentage of the Hispanic population, and their fertility is declining across generations in the US (Parrado and Morgan, 2007). It is worth

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(www.census.gov/population/socdemo/fertility/ofw-childtx). A third source of data is the National Survey of Family Growth. Hispanic women aged 40-44 in the 2002 NSFG averaged 2.49 children, about 0.2 children higher than in the CPS. Hispanic women aged 30-34 expected to bear 2.77 children in NSFG, implying rising fertility and giving some credibility to the still higher figure of NCHS.

remembering that Italian and Polish immigrants to the US had TFRs of 6.94 and 6.97 in 1905-09 when the US value was 3.56 (Morgan et al. 1994).

Areal Differences in US Fertility

Geographic differences in US fertility have been used in two primary ways. One is to examine the impact of interstate differences in laws, programs, and regulations that may be related to fertility. Moffit's (1998) review of research on the relationship between welfare payments and fertility, most of which is based on interstate data, concludes that there are modest positive effects of benefit levels on fertility, although there are some contrary findings including a subsequent article on the "family cap" (Kearney 2004). As noted below, Klerman (1999) finds modest effects of interstate differences in access to abortion and Medicaid payment schedules on fertility.

A second effort to use areal data focuses on identifying what may be thought to be "cultural" differences in attitudes, values and practices related to childbearing. Areal differences in fertility are substantial. Northeastern states with large proportions Catholic -- Massachusetts, New Hampshire, Rhode Island-- have 2004 TFRs in the lowest range of 1.7- 1.8. States with high Mormon concentrations, Utah and Idaho, have TFRs in the highest range of 2.3-2.5. Lesthaeghe and Niedert (2006) perform a factor analysis on a variety of state demographic data and find strong negative correlations between the total fertility rate in a state and the frequency of late marriage and of abortions per live birth. Since these are, in a sense, components of fertility, the results are not especially surprising.

More surprising is the high correlation they find, -0.87, between the factor representing this demographic cluster and the percentage of a state that voted for Bush in 2004. This correlation suggests that there may be important variation in the underlying structure of values and orientations that manifests itself in both family and political domains. That state differences are likely to reflect something more than different distributions of individual-level socioeconomic characteristics is suggested by the fact that the coefficient relating the TFR to women's educational attainment is only -0.10. To create an interstate difference in TFRs of 0.8-0.9 on the basis of differences in the distribution of educational attainment alone would thus require interstate differences in

mean years of schooling of 8-9 years, whereas the range of actual differences is only about 1.5 years (compiled from US Bureau of Census, 2007a). We are beginning a fertility project using merged individual and areal data.

International Differences

Table 5 shows that US fertility is higher than that in any other developed country with 5 million or more inhabitants. Even the lowest-fertility US state, Rhode Island with a TFR of 1.71 in 2004, would rank well above the median of 1.35. As noted above, the period TFR underestimates cohort fertility when ages of childbearing are rising. Few cohorts who have recently completed childbearing in Europe have TFRs less than 1.7 (Frejka and Sardon 2004). In terms of parity distributions, the major difference between Europe and the US is not in the prevalence of childlessness but rather of families with 3+ children (Caldwell and Schindlmyer 2003). The mean "ideal family size" in Europe remains at two or above except in Germany and Austria. In low-fertility Italy, it is 2.1 (Goldstein et al. 2003).

There is no single theory or explanatory framework that seems capable of accounting for a large fraction of the variance in fertility among developed countries. One leading contender is "the second demographic transition", according to which the emergence of individualism and its emphasis on self-fulfillment undercut familistic norms (e.g., Lesthaeghe and Neidert 2006; van de Kaa 1996). However, the northern European countries where ideational changes have been among the most far-reaching have the highest fertility levels in Europe (McDonald 2002), whereas southern and eastern European countries with low fertility have retained relatively high levels of familism in value surveys and in many other behaviors such as cohabitation and divorce (Coleman 2004; Kertzer et al. 2006).

A second overarching theory is that the rise in women's work opportunities relative to men's should reduce fertility because of the increasing opportunity costs of children (Becker 1981). This mechanism presupposes that women forego potential earnings and withdraw from the labor force in order to raise their children. Such behavior should create a negative cross-sectional association between fertility levels and women's rate of labor force participation. However, across European countries the correlation

between fertility and female labor force participation rates has become strongly positive at +0.81 (Billari and Kohler 2004). Countries in which the largest proportion of women work are countries with the highest fertility. This relation is also apparent regionally within certain countries such as Italy (Kertzer et al. 2006).

It is very likely that, because of industrial and occupational changes, the relative wages for women have risen in virtually all developed countries. Some countries appear have been able to adapt to this change in ways that better accommodate women's combining childbearing and work. These countries-- e.g., the United States, Sweden, Norway-- exhibit both high fertility and high female labor force participation. Some of the accommodations have been in the form of government programs. Hoem (2005) cites a battery of public policies in Sweden that he believes to be responsible for its relatively high fertility, including parental leave for 13 months at 80% of salary and state-run day care centers. Reviews of the effectiveness of family-friendly policies on fertility in Europe conclude that there have been several relatively modest successes (McDonald 2002, 2006; Kohler et al. 2006).

According to independent accounts of close observers in Italy (Kertzer et al. 2006) and Japan (Retherford and Ogawa, 2006), a major obstacle to higher fertility levels and greater participation of women in the labor force in these countries is the persistent strength of norms that idealize the traditional breadwinner/homemaker family. These norms discourage mothers from working and discourage unmarried women from becoming mothers. Mothers are thought to be the best guardians of their children, and men participate relatively little in child-rearing. Policy initiatives may have little impact under these circumstances. Japan has made very costly efforts to raise its fertility levels but the TFR remains in the neighborhood of 1.3. The programs include generous child allowances, heavily subsidized state child care facilities, changes in educational standards to reduce the costs of child tutoring, and laws designed to encourage men's greater participation in child-rearing.

Marriage is more important in sanctioning childbearing and sexual behavior in these countries. In Japan, only 2% of births are out of wedlock and in Italy, 10% (Kiernan, 2004). To state the obvious: discouraging out-of-wedlock childbearing discourages childbearing. If the US were to eliminate all out-of-wedlock births and not

replace them with marital births, its TFR would have been only 1.31 in 2004. Countries with higher proportions of births out of wedlock have higher TFRs: the correlation is +0.65 across 37 European countries in 1999. In 1975, when marriage was a stronger institution, it had been -0.35 (Billari and Kohler, 2004). Ironically, the maintenance of traditional family values, especially in the form of rigid norms about appropriate sex roles and the sanctity of marriage, may be responsible for very low levels of fertility in many places (see also McDonald 2000; Caldwell and Shindlmyer 2003).

Strong norms supportive of traditional family relations were also very prominent in the United States but they have substantially eroded. For example, the General Social Survey asked whether respondents agreed or disagreed with the statement that "It is more important for a wife to help her husband's career than to have one herself". Only 36% of women disagreed with the statement in 1977-78 while 80% disagreed in 1996-98 (Thornton and Young-DeMarco 2001). Perhaps the incentives to abandon the breadwinner/homemaker model were higher in the US or perhaps, as de Tocqueville (1945) argued 170 years ago, American society is more flexible and adaptive than European.

Whatever adaptations occurred in the US were not primarily a product of public policy (Morgan 2003). The US tax code is not especially friendly to families with children (d'Addio and d'Ercole 2005) and welfare benefits per child are low relative to child allowances in many European countries (Blau 1998). Government plays an unusually small role in day care for children in the US in terms of both finance and management. The adaptations permitting more mothers to work in the US were primarily a result of private negotiations between women and various childcare providers, including their partners. They were facilitated by institutional adaptations such as longer store hours, which provided both opportunities for shopping by people who worked during the day and jobs at an hour when a spouse may be available for child care (Kohler et al 2006). The labor market in the US may also be more accommodating to young workers than it is in many European countries. And businesses, less encumbered by industrial policies, may have been able to provide more flexible hours.

Another major theme of de Tocqueville's is that Americans are highly attracted to gathering in private associations. One institution that they join in far greater numbers than

Europeans is the church. 50% of American women aged 18-44 attend church at least once a month, compared to 26% of European women. 50% of American women report that religion is very important to them, compared to 16% of European women (European Values Survey data cited in Frejka and Westoff, 2006). The frequency of church attendance is highly positively correlated with fertility both in the US and in Europe. For young parents, a church often provides opportunities for interaction with other young families, childcare services, and moral support for the difficult endeavors of parenthood. These features may lift fertility levels among members. Taking literally the empirical relation between religiosity and fertility, Frejka and Westoff (2006) estimate that the fertility of American women aged 35-44 would be 6% lower if Americans attended church as infrequently as Europeans and 18% lower if they perceived the same importance of religion as Europeans.

These estimates represent upper bounds because there is undoubtedly self-selection of family-oriented people into the community of church-goers, a tendency that would spuriously elevate the correlation between fertility and religious behavior. Nor does their analysis control other variables, such as educational attainment, that are correlated with both fertility and church attendance. To overcome partially these problems, we have used the 2002 NSFG to estimate the relationship between fertility and the religion of one's upbringing, controlling a woman's years of schooling and ethnicity. Results are shown in Table 6. Fertility differs substantially- by a half a child or more- between those raised with no religion (about 6% of all women) and those raised with any religion. The additional variance explained by introducing the religious variables is significant at .001.

Thus, religious differences in fertility are not readily explained by mechanisms of selection or contamination by third variables. The greater religiosity of the American population cannot be ruled out as a contributor to US/European differences in fertility. The fertility differences by religious affiliation hold out the possibility that fertility will rise as high-fertility groups have more children who inherit the religion of their parents and maintain their high fertility levels. This possibility is not entirely theoretical: the growth of fundamentalist Protestant groups in the past century is attributable primarily to their unusually high fertility combined with a 70-80% intergenerational retention rate

(Hout, et al., 2001). The example illustrates a more general point: there is upward pressure on fertility each generation by virtue of the fact that each generation is born disproportionately to the high-fertility members of the previous generation.

Implications

What have we learned that bears upon the future of American fertility? Several variables associated with fertility are changing in predictable ways. One of these is ethnicity. The US Census Bureau projects the size and ethnic composition of the US population using data on fertility achievements and expectations and anticipated immigration. Its latest projections suggest that the Hispanic population will grow from 12.6% of the population in 2000 to 20.1% in 2030 (US Census Bureau, 2004a). Combined with the large Hispanic/non-Hispanic fertility differentials shown in Table 3, and assuming that fertility levels remain constant within ethnic categories, this increase in Hispanic representation would increase the TFR from 2.046 to 2.113, an increase of .07 children.

A second variable related to fertility and moving in predictable directions is educational attainment. The US Census Bureau (2000b) projects educational attainment distributions to 2028. For adult women, their projections imply a gain of approximately 0.7 years of school completed between 2003 and 2028.[7] Combined with the fertility coefficient on years of schooling of -.097, such changes should produce a reduction in fertility of .07 children. The effect is not large, and it should be recalled that the coefficient of women's education has been declining.

So the two most predictable changes in population composition, educational attainment and ethnicity, are expected to induce relatively small changes in fertility by 2028-30, and these changes essentially offset one another. In a multivariate framework, the combined changes in distributions of education and ethnicity would produce a decline in fertility of .02 children. [8] Other factors that may play a role:

[7] This is the mean gain for the high and low projections, weighted by ethnicity distributions in 2000 and assigning 10 years of schooling to those who did not complete high school, 12 to those who did, 14 to those who started but did not finish college, and 17 to those who finished college.

[8] The coefficient of educational attainment in a regression controlling age and ethnicity is -.083.

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- improvements in contraceptive technology should put mild downward pressure on fertility. But improvements have been very slow since the 1960's, especially in the area of male contraception. And they may be significantly offset by improvements in proceptive technologies for subfecund individuals. Barring advances in technology, improvements in contraceptive use could be expected to accompany improvements in educational attainment and to be captured by the estimated effects thereof.

- a more conservative Supreme Court may result in greater restrictions in access to abortion. Based on studies of interstate differences in access to abortion and in Medicaid funding thereof, the effects on fertility would not be large. Klerman (1999) estimates that eliminating funding altogether would increase the TFR by 2%; making all abortions illegal would increase it by an additional 3%.

- eventually, the rise in ages at childbearing must come to an end. This process has reduced the period TFR by approximately 0.15 children per woman. When it stops, period rates (but not cohort rates) will be pushed upwards. At the rate at which the mean age at childbearing is rising in the US, approximately 0.08 years per year, it would take 20 years before the mean age in the US reaches the level of 29.5 years already observed in Sweden (and exceeded in France, the Netherlands, Ireland and Spain; compiled from US Census Bureau 2004b.) So the timing-induced depression in US period rates could last a long time. But the calculation does suggest that modeling fertility timing is an important element in fertility projections.

Fertility in the United States is relatively high, even for its lowest-fertility groups. Compared to most countries in Europe and East Asia, fertility is high even for white non-Hispanics, for states with the lowest fertility, and for college graduates. Until the source of this discrepancy is better understood, it introduces substantial uncertainty into fertility projections.

One possible explanation of American "exceptionalism" is an unusually flexible and adaptive society, one in which women were able to react quickly to the rise in their work opportunities and find ways to combine motherhood and work while many other societies stayed wedded to more traditional family forms. If American women have simply been quicker to find ways to do things that women elsewhere also want to do--have at least two children even when they have attractive earnings prospects outside of

the home-- then fertility elsewhere should rise to American levels as women and men adapt to new circumstances and abandon older cultural forms.

A second possible explanation of American exceptionalism is the unusually high degree of religious belief and participation among Americans. Projecting religiosity into the future is risky, in part because recent trends are not entirely consistent. The proportion of American adults identifying their religious affiliation as "no religion" in the General Social Survey rose from 7% to 14% between 1991 and 2000 (Hout and Fischer, 2002); the rise was especially sharp among young adults. On the other hand, the proportion of adults who identify as conservative Christians continues to grow, fueled by differential fertility and high rates of intergenerational retention. The possibility that American fertility has strong religious underpinnings does not suggest a clear-cut direction for future fertility trends, but it does add uncertainty to them.

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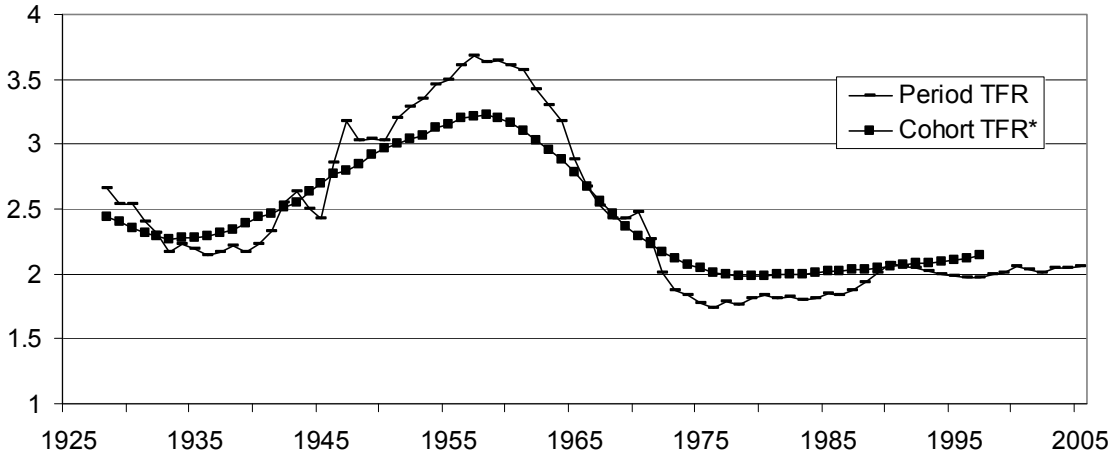
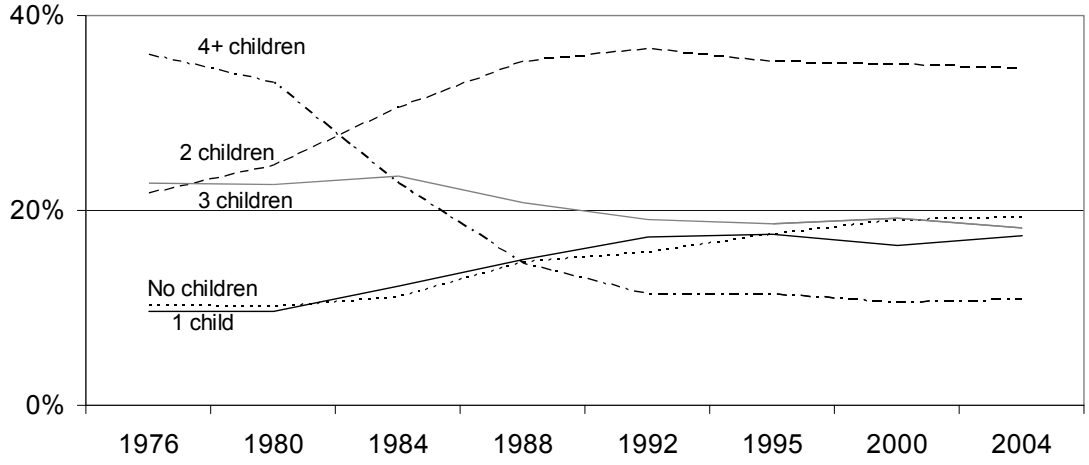
Figure 1. Period and cohort total fertility rates, United States 1928-2005



*For cohort born t-26; Note: Last data points for CTFR use imputed data; Sources: Schoen 2004, National Center for Health Statistics 2005b, 2006a

Figure 2. Distribution of women 40-44 by number of children ever born



Source: US Census Bureau 2005a

Table 1. Mean number of children ever born by women's educational attainment, women 40-44			
	1973	1988	2002
Less than high school	3.86	2.92	2.75
High school graduate/GED	2.96	2.17	2.19
Some college	3.02	2.12	2.00
Bachelor's degree or higher	2.86	1.58	1.73
Total	3.26	2.15	2.11

Note: Educational attainment based on number of years of school completed; Sources: National Surveys of Family Growth

Table 2. Coefficient of years of schooling completed among respondents aged 30-44, National Survey of Family Growth 1973, 1988, 2002			
Survey year, sex	**Dependent Variable**		
	Total births expected	Current parity	Additional births expected
1973 Women	-0.153 *	-0.157 *	0.004
1988 Women	-0.126 *	-0.163 *	0.037 *
2002 Women	-0.097 *	-0.150 *	0.053 *
2002 Men	-0.053 *	-0.101 *	0.048 *

*Significant at 0.001 level; Note: Age is controlled via a second-degree polynomial

Table 3. Total fertility rates among major ethnic groups, United States					
	Total	Non-Hispanic Whites	Non-Hispanic Blacks	Hispanics	
				All	Mexicans
1989	2.014	1.770	2.424	2.904	2.916
1996	1.976	1.781	2.140	2.772	3.052
2004	2.046	1.847	2.020	2.824	3.021

Source: National Center for Health Statistics, 2006b

Table 4. Coefficients of ethnicity among women aged 30-44, National Surveys of Family Growth 1973, 1988, 2002			
Survey year, race	**Dependent Variable**		
	Total births expected	Current parity	Additional births expected
Non-Hispanic Blacks			
1973	0.688 *	0.634 *	0.054 *
1988	0.236 *	0.204 *	0.032
2002	0.233 *	0.215 *	0.018
Hispanics			
1973	0.211	0.062	0.150 *
1988	0.352 *	0.210	0.142 *
2002	0.426 *	0.336 *	0.096 *

*Significant at 0.01 level; Note: Age, age squared, and years of schooling completed are controlled

Table 5. Total fertility rates in selected developed countries*			
Country	**TFR (year)**	**Country**	**TFR (year)**
United States	2.05 (2005)	Hungary	1.35 (2006)
France	1.98 (2006)	Spain	1.34 (2005)
Sweden	1.85 (2006)	Germany	1.34 (2005)
Denmark	1.85 (2006)	Greece	1.34 (2005)
Australia	1.81 (2005)	Czech Republic	1.33 (2006)
Finland	1.81 (2006)	Ukraine	1.32 (2006)
United Kingdom	1.79 (2005)	Russia	1.31 (2006)
Belgium	1.72 (2005)	Romania	1.31 (2006)
Netherlands	1.68 (2006)	Poland	1.28 (2006)
Canada	1.52 (2005)	Slovakia	1.25 (2005)
Switzerland	1.43 (2006)	Japan	1.25 (2005)
Portugal	1.41 (2005)	South Korea	1.13 (2006)
Bulgaria	1.38 (2006)	Taiwan	1.12 (2005)
Austria	1.38 (2006)	Hong Kong	0.99 (2006)
Italy	1.35 (2006)		

*Countries with populations above 5 million; Source: Population Reference Bureau http://www.prb.org/pdf07/TFRTable.pdf

Table 6. Coefficients relating the expected number of births to religious affiliation at age 16, women aged 30-44, National Survey of Family Growth 2002	
No religion	-0.444
Mainline Protestant	0.000
Fundamentalist Protestant	0.194
Catholic	0.127
Other non-Christian religion	0.264

Note: Age, age squared, years of schooling completed, and race/ethnicity are controlled