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ABSTRACT

This paper analyzes a five percent systematic sample of households from the manuscripts of the New York State Census of 1865, the first in the United States to ask a question on children ever born. The sample of seven counties (Allegany, Dutchess, Montgomery, Rensselaer, Steuben, Tompkins, and Warren) was selected to provide a diversity of locations, settlement dates, and types of agricultural economy. The parity data indicate a strong decline in marital fertility during the first part of the 19th Century; little evidence of fertility control within marriage is found for the oldest women in the sample, but analysis of parity progression ratios indicates that control had emerged by the midpoint of the 19th Century. Fertility decline was initially most evident in the urban, more economically developed areas, but eventual levels were equal in the urban and rural parts of the sample. While a marital fertility transition occurred in 19th Century New York, many couples continued to have quite high levels of fertility, indicating the difficulty that many couples probably faced in controlling their reproduction.

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INTRODUCTION

The first sustained fertility declines occurred on the European continent and in areas of overseas European settlement in the 19th century. Most studies of the transitions have concentrated on the last two or three decades of the nineteenth century, when fertility commenced its decline in many presently developed nations (Coale and Watkins 1986). There is also a body of research on the earlier fertility declines in France and in the United States, areas which innovated in the transition to the small family (van de Walle 1978; Wrigley 1985; Easterlin 1977; Vinovskis 1981; Smith 1987).

Interpretations of the general Western fertility transition have varied greatly. Some (Caldwell 1982) have viewed the transition as causally related to the process of social and economic transformation occurring in Europe, particularly the declining economic utility of children, while others (Knodel and van de Walle 1979; Lesthaeghe 1983) have argued that the structural changes were only weakly related to the transition. Rather, they have emphasized such factors as the diffusion of technical knowledge about fertility control and cultural receptiveness to the idea of relatively small families. .

The U.S. fertility transition of the nineteenth century constitutes an important, although somewhat unique, part of the general European transition. By 1800, the white population of the United States apparently had one of the highest fertility rates in the world, certainly in Europe and North America (Sanderson 1979). During the nineteenth century, a long-term decline in U.S. fertility occurred, although it was by no means continuously sustained (Tolnay et al. 1982; Smith 1987). In addition, earlier and more rapid decline was especially characteristic of the New England and Middle Atlantic states, including New York. Little consensus exists on why the U. S. fertility transition occurred in the early to middle 19th Century. Hacker (2003) argues that the

fertility transition was only weakly related to changes in marital fertility patterns; rather, increases in the age at marriage and increasing levels of mortality produced overall declines in child-woman ratios.

The present paper will utilize individual and household level data from the manuscripts of the 1865 New York State census to investigate patterns of fertility in seven counties that represent the social and economic diversity of the state. Particularly useful are the data on children ever born (parity), collected for adult women as part of the regular enumeration in June, 1865. This census seems to have been the first regular enumeration in human history to have asked such a question. (1) The manuscripts also contain information on the name, age, sex, race, marital status, place of birth, race, and relationship to head of household of each household member. By using the household data, we match characteristics of wives with their husbands and study recent childbearing by matching own children records with their mothers.

Using the children ever born data, we document declining fertility within marriage and the probable emergence of low to moderate levels of fertility control. In addition, using published data from the 1865 census on aggregate characteristics of the over 900 towns and cities of the state, we show how social structural characteristics of communities such as economic levels and the availability of farmland influenced fertility variations.

RESEARCH ON THE U.S. FERTILITY TRANSITION

Research on the causes of the U.S. fertility transition has traditionally been somewhat detached from studies of the European transition, although they involved similar time points and cultural groups. A central scholarly question has been why the United States had a fertility transition when it was still predominantly rural. More traditional demographic transition theory (Mason 1997) has viewed rural conditions as generally incompatible with fertility decline for a

variety of reasons, including the relatively high economic utility of children in agricultural production and the difficulty of farm women in developing distinctive work roles that would provide clear alternatives to childbearing.

In dealing with the causes of the American rural fertility decline, research by economists has stressed shortages of available farmland as a major factor (Easterlin et al. 1978; Forster and Tucker 1972; Leet 1976; Schapiro 1982; Yasuba 1962). As the century progressed, farmland became scarcer and more expensive, especially in the older, longer settled portions of the United States. Thus, families are hypothesized to have experienced cost increases which led to fertility restriction. These included difficulties in providing endowments (especially land) to children when family size was large, and also problems among the younger generation in marshalling resources to afford marriage. Resulting delayed marriage would have restricted the time in the reproductive life cycle for childbearing.

Other research (Leasure 1982) has explained the American fertility decline as a consequence of the rise of individualism, which allowed families to reject traditional high fertility norms. Leasure has primarily measured individualism across geographic areas in terms of the proportion of residents who belonged to Protestant Churches with a strong emphasis on freewill in religious commitment, especially Congregationalists, Friends, Presbyterians, Unitarians, and Universalists. Leasure's approach is somewhat similar to that of Lesthaeghe (1983) which explains the continental European decline in terms of cultural factors such as the secularization of the society.

Still other research (Guest 1981; Guest and Tolnay 1983) has attempted to relate the U.S. transition in the late 1800's more directly to causes that have been discussed in relationship to the European continental transition. Two factors have been especially emphasized: first, the growing

trend toward urbanization and industrialization, and, second, the growing economic costs of children through increasing enrollment in school during the teenage years, rather than employment. Since the growth of U.S. educational systems was not always closely associated with urbanization or industrialization (Guest and Tolnay 1985), it could exert an independent influence on fertility in a relatively rural society. In addition, the farm mechanization of the United States has been viewed as an important social force which reduced the need for agricultural labor, thus limiting the economic utility of farm children (Guest 1981). Some of this research (Guest 1981) suggests that the availability of improved farm land affected fertility through delaying marriage, rather than directly within marriage. In other words, land availability itself may have had only a weak causal relationship to variations in marital fertility.

Consistent with this perspective is research (Sundstrom and David 1988) that stresses the increase in employment opportunities for farm children resulting from the growth of urban areas and non-agricultural industries. Children lost much of their value to parents because they were decreasingly willing to wait through adulthood to provide old age support and inherit the farm. Carter, Ransom, and Sutch (2004) generally agree with this model, but also note that other life cycle factors such as increasing rates of school attendance made children economically costly for farm parents. They reject the target-bequest model implied by the land availability hypothesis.

There are several problems with previous research on the American transition. The vast bulk of the studies before 1880 are aggregative in nature, typically relying on crude measures of fertility such as child-women ratios (see Smith 1987). One notable exception to this are the studies of the northern United States in 1860 using the Bateman-Foust sample by Easterlin (1976) and Easterlin, Alter, and Condran (1978). The fertility measures were, however, simple marital child-woman ratios. While aggregative studies are useful, it has generally been

impossible to determine the degree to which fertility was related to broad aspects of the environment (included in the analysis) as opposed to more immediate household characteristics which have typically not been included.(2) Some important household predictors might be social-economic position and economic well-being. In addition, the studies have frequently considered a limited range of aggregate predictors, typically providing poor coverage of such characteristics as urbanization- industrialization, and the development of educational systems. Clearly, the measurement of fertility could also be improved.

NEW YORK STATE IN THE NINETEENTH CENTURY

Data from the federal and state censuses of New York permit some very rough estimates of crude birth rates for various time points in the early and middle 1800's. Federal data are available for years ending in 0, while state data are based on years ending in 5. Using the published sources, we have estimated the ratio of enumerated infant children under 1 per 1,000 total population. These numbers undoubtedly underestimate fertility in the population, due to inability to adjust directly for high infant mortality and also probable high underenumeration of children under 1 year of age, but they provide a first approximation to fertility trends.

The data suggest little linear trend in fertility. The relatively high fertility in the late 1830's and early 1840's was followed by sharp decline in the late 1840's. Fertility then increased again in the early 1850's, to be followed by another decline from 1855 to 1865. The estimated infant-population ratios (children aged 0 per 1,000 population) by year are 1835, 35.5; 1845, 34.5; 1850, 24.3; 1855, 29.6; 1860, 26.7; 1865, 24.3 (Guest, 1990). Certainly, the figures for 1835 and 1845 indicate quite high fertility, especially given the fact that the total births have not been adjusted upward to account for the (probably) high rate of infant mortality. For the 1850 through 1865 enumerations, it was also possible to calculate more refined rates based on the age of

women in the reproductive years. These measures suggest the same general conclusions as the cruder infant-woman ratio.

Some of the fluctuations in fertility may have reflected the importance of foreign migration to the United States; the immigrants, especially drawn from Ireland and Germany, clearly had higher fertility than the U.S. natives in the Northeast. In addition, fertility changes from 1860 to 1865 may indicate the influence of the American Civil War, which drew large numbers of younger men from their local communities. Some portion of the fluctuations was probably due to changes in accuracy of enumeration of infants and fluctuations in infant mortality (such as that possibly caused by the cholera epidemic of 1849).

Fortunately, there are several available studies which use data from the New York state census to investigate historical fertility patterns. These studies may be divided on the basis of whether they primarily focus on individual (microdemographic) or aggregate-level social correlates of fertility. The individual-level studies, of different counties and time periods, share less agreement on the correlates of fertility variation than the aggregate studies.

Perhaps the major original analysis of the 1865 census data was Bash's (1955) microdemographic study of Madison County, in the central Finger Lakes area of the state, which had originally been settled in the late 1700s and early 1800s by natives of New England. His study was especially important because he related various household and individual social characteristics to fertility variation, albeit within one limited geographic area. Predominantly rural, Madison County was characterized by relatively (although not strikingly) low fertility in comparison to the rest of the state. Of the "independent" variables considered, foreign birth was a strong positive predictor of fertility, while white collar workers had somewhat lower fertility than unskilled workers. Interestingly, farm owners and farm tenants-laborers did not stand out

for especially low or high fertility. While perhaps unanticipated, this finding was reasonable, given the fact that predominantly agricultural Madison County did not stand out for high overall fertility within the state. Another good correlate of fertility was the value of the dwelling, with owners of the cheapest dwellings having the highest fertility.

Bash also considered the role of farm characteristics in differentiating fertility among the agricultural population. Neither value of the farm nor value of farm tools and implements was especially useful for differentiating fertility behavior; interestingly, fertility was highest among the poorest and richest farms. He did not report data on the relationship between farm size and land availability, on the one hand, and fertility variations, on the other hand.

On the whole, then, the data suggest that measures of social status and birthplace were more useful for understanding fertility than measures of variations in agricultural life. Such results imply that aspects of social and economic aspirations for themselves or their children may have been important in understanding New York fertility variation, at least in Madison County. Or, household roles of men and women may have varied by social status, affecting fertility behavior.

A somewhat different empirical perspective on fertility variations at the time is provided by Stern (1987) in his study of Erie County, which includes the large city of Buffalo. He used child-women ratios (children aged 0-4 divided by reproductive age women) for 1855, rather than differences in children ever born for 1865. While useful, comparisons of child-women ratios across groups may suffer from differential infant and early childhood mortality. In contrast to Bash, Stern finds relatively small fertility differences over urban occupational classes, except for the low fertility of professionals (Stern 1987, P. 52). Stern did discover that occupational differences emerged much more clearly by 1900. Similar to Bash, Stern (1987, P. 56) ascertained that foreign born women had somewhat higher fertility than the natives in 1855.

Some of Stern's most interesting findings relate to fertility differentials among farm families in Erie County in 1855. Contrary to the land availability thesis, farmers with small amounts of unimproved land were not characterized by especially low fertility. For farm owners, most agricultural characteristics related to their wealth, mechanization, and land availability made little difference in fertility. However, among tenants, the high fertility of the poorest farmers stood out (Stern 1987, p. 124), a finding which would seem quite incompatible with the idea that fertility restriction occurred due to the difficulty of assembling one's or children's land.

The pioneer aggregate study of historical fertility patterns in New York was conducted by Bash (1963) who analyzed variation in child-women ratios for townships throughout the state in 1855, 1865, and 1875. Using analysis of variance techniques, he found that population density, proportion native born, farm land value, and value of home dwellings were all negative predictors of fertility levels. While he did not especially emphasize the fact, the value of dwellings stood out as the strongest predictor. The child-women ratios were highly correlated over the time periods, but the evidence in his study clearly suggested that related factors such as population density and urbanization were decreasingly important as predictors of variations in child-women ratios. Indeed, there were few urban-rural differences in fertility in 1875. Bash's procedures involved tests for the importance of a quite limited number of community-level variables. Furthermore, the independent variables were not all considered together as predictors, to determine their relative power when the other variables were controlled.

Guest (1990) has also analyzed the aggregate-level correlates of New York fertility for counties in 1865, using data reported in the state census on parity distributions of native and foreign-born ever-married women, regardless of age. The probability of having any births and the probability of advancing from the fifth to the sixth births were the major dependent variables.

These two variables were considered separately because childlessness might be a different phenomenon than other fertility decisions. Indeed, the geographical distribution of the two progression ratios was somewhat different. Interestingly, childlessness was especially high in some of the most rural parts of the state, especially in the central region (such as Madison County).

One virtue of Guest's study is the large number of independent variables in the analysis. Not surprisingly, parity progression ratios across counties were influenced by the female age structure and the prevalence of early, universal marriage. There were also a large number of social and economic variables which correlated with both progression ratios, including measures of economic development, educational orientation, land availability, urbanization and industrialization, orientation to religion and religious individualism, and the state-national birthplace origins of the residents. While several variables were correlated with parity progression ratios, the number of variables with a clear independent influence on fertility was relatively small. In particular, the value of homes was a striking negative correlate of both progression ratios. This was true for both native and foreign-born women. In addition, the importance of school attendance as a positive predictor of childlessness for native women was clearly evident. A major limitation of Guest's study was his inability to control directly for the age structure of the women. Patterns among older women, for instance, might be different from those among younger women.

The finding in both aggregate studies about the importance of home value to understanding fertility variation is quite consistent with previous studies of France and Massachusetts about the same time (McQuillan 1984; Van de Walle 1978; Vinovskis 1981). In addition, it is consistent with two non-aggregate studies (Ryan 1981; Stern 1987) which emphasize the relationship of

economic prosperity and materialism in nineteenth century New York to changes in the nature of families, especially in the business and professional classes. Stern's study of Erie County (Buffalo) and Ryan's of Oneida County (Utica) argue that growing prosperity was associated with a breakdown in traditional communal or patriarchal families. Opportunities to achieve economic prosperity led families to emphasize the acquisition of goods and material possessions rather than children, and to concentrate their wealth on enhancing the occupational and educational opportunities of a limited number of children. Large numbers of children simply contributed little directly to the family economy, and the family's material prosperity was primarily enhanced by the efforts of the husband in a market-oriented economy.

From this review of studies, it seems clear that areal variations in New York state fertility in the mid-1800's probably related most strongly to "modernization" variables, especially associated with economic development and the importance of educational systems. On the whole, strong evidence for the direct importance of agricultural systems cannot be clearly discerned, especially when one focuses on the role of land availability. Indeed, the land availability arguments are not supported at the individual level either. The studies of individual-level variation in fertility seem confusing on the major social correlates of low fertility.

SAMPLE AND METHODS

The present analysis will proceed from a five percent systematic sample of the 1865 census manuscripts for seven counties: Allegany, Dutchess, Montgomery, Rensselaer, Steuben, Tompkins, and Warren. These particular counties were selected to represent various regions of the state with different dates of settlement and varied economies. Some of their characteristics are shown in Table 1.(3) So, for example, Allegany is located in the far western part of the state, while Warren is located by the Adirondack mountains in the northeastern portion of the state.

Both Allegany and Warren counties were relatively newly settled (by New York standards), had a high proportion of adult males as farmers, rather low urbanization, low home values, and lower fractions of agricultural land improved. In contrast, the longer settled counties of Dutchess, Montgomery, and Rensselaer had much higher levels of urbanization and lower proportions of farmers among the adult male population, higher home values, and high proportions of total agricultural land improved. Dutchess and Rensselaer are located in the Hudson valley and Montgomery was located somewhat west of them and Albany in the Mohawk valley. On the whole, Tompkins and close-by Steuben, in the central Finger Lakes region, represent intermediate cases between the other two groups of counties, although parts of Steuben sit in the plateau of the Allegany Mountains. The sample contains two urban areas of significant size, the cities of Troy (with a population of 39,293 persons in 1865) in Rensselaer County and Poughkeepsie (with 16,073 inhabitants in 1865) in Dutchess County.

The overall sample contains 16,360 individuals in 3,325 households, representing 4.77 percent of the 343,150 individuals in these seven counties enumerated in the census of 1865. This is a bit less than the sampling fraction of five percent because of some missing and illegible manuscript pages and uninhabited dwellings which were encountered in the sampling procedure. The sampling procedure was to take every twentieth household in each enumeration district with a random starting point at the beginning which was different for each county.(4)

TABLES 1 AND 2 ABOUT HERE

The context of the fertility decline in the seven counties is given by Table 2. Child-woman ratios (children aged under 5 per 1,000 women aged 15 to 49) are calculated for the white population (the total population in 1855 and 1865). They are based on both the published Federal and state census documents. It is clear that (a) New York State was experiencing a

fertility transition in this era, albeit uneven (e.g., the 1850s); (b) fertility ratios were lower in New York than the average for the nation as a whole; (c) fertility outside New York City was generally higher than in the city; (d) this difference tended to converge over time; and (e) the experience of the seven sample counties tracked that of New York outside New York City, although the decline in the seven counties was a bit more rapid between 1830 and 1875.

In the subsequent analysis of the relationship between community characteristics and fertility, the basic geographic unit will be the township (town). As in other Northeastern states, New York townships have historically been major social and political units, and the 1865 census reports numerous characteristics for each. In 1865, there were over 900 townships in New York, and our analysis uses the 192 towns in the seven counties. In addition, the 16 total political wards of Poughkeepsie and Troy, the two largest places, will be treated as equivalent to townships.

FERTILITY IN NEW YORK STATE, 1865

When provided with such data on children ever born, one of the first questions to be asked concerns average parities by age. Table 3 tabulates average parity by age of women for the total sample, for the foreign-born population, and for the rural and urban native populations. Parities are calculated for ever-married women (i.e., currently married, widowed, or divorced). In general, historical trends in fertility may be inferred by comparing age groups of women over 45, since the biological ability to bear children is generally quite low after this age.

TABLE 3 ABOUT HERE

A perusal of Table 3 indicates that there was a relatively regular increase of parities with age among the native born women (including the ever-married), lending confidence to the reliability of the data. This result also provides important direct confirmation of the fertility decline in the

United States in the first half of the nineteenth century. Among ever-married native-born women, the declines in average parity were from seven for women aged 75-79 (i.e., born 1786/90 and in their peak childbearing years during the period approximately 1806/1825) down to 4.6 children per woman aged 45-49 (i.e., born 1816/20 and in their peak childbearing years during about 1836/1855). Unfortunately, the sample sizes at the oldest ages for these subsamples are relatively small and thus subject to larger sampling errors. Nonetheless, the results from analysis of child-woman ratios and other aggregate census tabulations are strongly supported by these parity data. Doubts about the reality of the decline of fertility among white American women in the antebellum period can be assuaged by these data.

The patterns for the foreign born women, disproportionately drawn from Ireland, Germany, and the United Kingdom, show little regular change in the age groups over 45. There are some problems of interpretation, because the sample sizes in various age groups are typically quite small. However, the data are consistent with the general conclusion that the fertility transition had not begun yet in most of the European countries.

Especially interesting are the longitudinal differences in fertility among the native born urban and rural women. There are striking declines in fertility among both groups of women, indicating a transition in both populations. However, the relationship of urbanization to fertility changes with the age of the women. Among the women over 45, who have typically completed their reproductive periods, there is a general tendency for rural fertility to be higher than urban. However, among the women under 45, there is hardly any relationship between urban residence and fertility. This is consistent with Bash's (1963) cross-sectional analysis of child/women ratios across New York counties between 1855 and 1875. The data thus suggest that the fertility transition spread from the urban to the rural areas, but the fertility level of the urban women was

still quite high in 1865 (at least by the standards of the 21st Century in the United States).

FIGURE 1 ABOUT HERE

Figure 1 summarizes changes in the nature of reproduction among native-born New York women, according to the 1865 Census. The horizontal dimension indicates the approximate year of birth of ever married native born women. We cannot determine the exact year of birth, but we can approximate it by subtracting age in years from 1865. The state census was taken in the middle of the year and age (rather than year of birth) was obtained. The four curves indicate, respectively, the proportion who reported births of at least 1, 3, 5, and 7. If one focuses on the proportion having at least seven births, the transition was quite dramatic and continuous. Of women completing their childbearing at the time of the Civil War, only slightly more than 20 percent had as many as seven births, while over 50 percent of women who were born in the late 1700s had this number. The data in regard to having at least five children present a similar portrait, although the percentage decline is less over the birth cohorts. Clearly, the transition primarily represented the continuous decline of the very large family.

One of the major trends of the very late 1800s and the 20th Century was the gradual emergence of a 2 to 3 child family norm among American women (David and Sanderson 1987a; Ryder 1969). Consistent with this, our New York data, for an earlier period, show little indication of a convergence on what might be described as the "modern" American family. Indeed, Figure 1 actually shows a decline, albeit slight, over the birth cohorts in the proportion having three children.

Of special interest are the data on childlessness for women who reported on children ever born and gave an answer of zero. This pattern may be inferred from Figure 1 for the curve showing ever-married native women over 45 who had a least one birth. In general, childlessness

over the age cohorts was less than 7 percent (except for the youngest women) and shows no longitudinal trend. Most likely, these numbers are quite low and indicate little voluntary childlessness. So, for example, the tabulations of parity from the 1910 Federal census manuscripts done by the Bureau of the Census reveal, for ever-married white women, 9.6 percent childless for women aged 45-49 and 7.9 percent for women aged 70-74. This was 11.1 percent and 9.1 percent, respectively, for women residing in the Middle Atlantic Region (which included New York) (U.S. Bureau of the Census 1943). The 1911 Census of Marriage and Fertility of England and Wales revealed that only 5.8 percent of women married in the period 1861-1870 and married at ages 20-24 remained childless. Among the same marriage cohort but married at ages 25-29, 9.9 percent remained childless (Leridon 1977). Tolnay and Guest (1982) note percentages childless beyond reproductive ages among women in natural fertility populations of 3 to about 10 percent, depending on marriage age. Such comparisons would indicate that older ever-married native women in New York State in 1865 were not controlling fertility generally with voluntary childlessness. A high proportion of women at zero parity at ages above 45 probably experienced biological sterility either themselves or through their spouses.

It is possible that some of the longitudinal trends in fertility that we have identified were due to changes in nuptiality, with an increasingly late age at marriage reducing the fecund reproductive period for couples. Unfortunately, the 1865 census data do not permit investigation of the changing age at marriage, but the New York State censuses in the middle of the nineteenth century also preceded the Federal census in eliciting information on marital status. The data indicate that nuptiality in New York at this point in time was not greatly different from that found at the end of the nineteenth century. In addition, among all native born women over 40 in 1865, there was essentially no relationship between age and the percentage never marrying.

Generally, populations have a strong positive relationship between late marriage and percentage never marrying.(5)

Concerns have been expressed (David and Sanderson 1987a) about using unadjusted retrospective data on children ever born to study historical changes in fertility across birth cohorts. Two major problems have been outlined. First, due to differential mortality by parity, older women may be a selective sample of the women who actually bore children at earlier points in time. David and Sanderson (1987a) suggest that in populations with low fertility control, high parity women (due to good health) tend to have high survivorship. They also infer that in populations with high fertility control the low parity women have higher survivorship (due to better self-care in regard to health matters).

In contrast, Shryock and Siegel (1971, 512) reach more cautious conclusions on the basis of reviewing reports of children ever born by specific age cohorts over several U.S. censuses. They claim "[t]here is no definite evidence, however, that mortality is selective of the more fertile women." Much of David and Sanderson's argument is based on an analysis of children ever born reports by cohort in the 1910 and 1940 U.S. censuses, where some discrepancies occur (U.S. Bureau of the Census 1945). But Shryock and Siegel point out that the questions in the two censuses were worded differently and the censuses had somewhat different rates of nonresponse to the questions. Shyrock and Siegel find virtually no trend in children ever born for birth cohorts of women who could be traced over 20th Century censuses.

A second potential problem is differential recall by age, so that older women are less likely to remember births than younger women. This potential problem would have the effect of understating the differences we have found by age cohort. Much of the concern about this issue is apparently based on observations of "nonnumerate" societies (Brass and Coale 1968: 91), but

the adult native-born population of New York in the 19th Century was highly literate (although not necessarily highly educated) as Table 1 shows for the seven counties.

PARITY DISTRIBUTION

Since the women in the sample report the specific number of children ever born, it is valuable to use parity progression ratios to inspect patterns of childbearing in New York in the early and mid-19th Century relative to other populations. The average number of births among a group of women may obscure interesting information about the distribution of family sizes. Parity progression ratios measure the probability of having an additional birth (n + 1) once one has achieved "n" births.

There should be a natural tendency in any population for the progression ratios to decline slightly with the parity number, partly because women at high parities are, on average, older than women at low parities, and thus have lower fecundity. But, in general, parity progression ratios should show little decline with parity in populations over 45 that do not practice conscious birth control, primarily because couples make little effort to stop childbearing at any socially acceptable number before reaching the end of the fertile reproductive period. While high parity progression ratios are consistent with low fertility control, they do not indicate whether the children are desired. Survey studies in the last part of the 20th century show, nevertheless, a clear tendency for American women of high parity to report an unusually high number of births that were not desired or occurred at the "wrong time" in the parents' life cycle (Bumpass and Westoff 1970).

FIGURE 2 ABOUT HERE

Figure 2 shows the pattern of parity progression ratios for two North American populations that are believed to exert only minimal control over their fertility. One set of ratios is reported

by Eaton and Mayer (1953, Sheps 1965) for the well-known Hutterite population, over the age of 45 in 1950. These women had a median number of 10.4 children and are believed to have exerted virtually no conscious control over their fertility. The Hutterite parity progression ratios show only a mild decline with parity. The other set of ratios is based on data for Old Order Amish women over 45 in 1964 in Holmes County, Ohio. As the authors Cross and McKusick note (1970, 100), "[d]elayed marriage is the only detectable means of family limitation." We have arbitrarily set the progression ratio to the first birth as 1.0 because the data source does not permit exact calculation, although it is clear from the materials that the ratio is actually slightly lower. The Amish parity progression ratios are quite similar to the Hutterite pattern but show slightly more decline, a pattern that may be due primarily to the later age of marriage of women and to possibly poorer fecundity due to health, but may also indicate some very slight degree of conscious fertility control.

Certainly, the oldest New York women should have parity progression ratios that are similar to the Hutterites and Amish, partly because fertility levels were so high. But, adult men and women in the Civil War period did not have access to the easy-to-use and effective contraceptive techniques that have become important in the past few decades. One may presume that a high degree of sexual self-control was required to guarantee that women would bear not more than two or three children. Abortion was available, but was not generally sanctioned positively. Sexual abstinence for long and short periods was undoubtedly practiced, but required great "moral" restraint. Condoms were available but the materials of construction (such as leather sheaths) were not conducive to sexual pleasure. There was, however, a substantial literature related to contraception and abortion, which grew in the antebellum period (Brodie 1994, chs. 5-6). Just how much of it was accessed by rural and working class people is, however, unclear.

Two sets of ratios are shown in Figure 2 for native ever-married women in the sample of the seven New York counties, for women 45-59 in 1865 and women over 60 in 1865. While ratios could be calculated for more detailed age groups, we have presented these two due to the fact that the sample sizes became embarrassingly small with more age-specific groups. Women over 60 would have typically borne children at least 20 years earlier, before 1845.

The pattern for married women over 60 (born approximately before 1805) is strikingly similar to the Amish pattern, suggesting little (but perhaps some) conscious fertility control. The over-60 pattern has less overlap with the Hutterites, who almost certainly practiced virtually no conscious fertility control. Since age at marriage data for these older New York women are unavailable, we cannot assess its role in the progression ratios. Nevertheless, the singulate mean age of marriage (Hajnal 1953) among native-born New York women in the reproductive ages was about 23.6 compared to a reported age of 22.6 for all wives among the Holmes County Amish (Cross and McKusick 1970). The most plausible conclusion is that these older women exerted, at best, quite low control over their fertility.

In contrast, the pattern for New York women 45-59 (born approximately between 1806 and 1820) does suggest clearly the emergence of birth control. They diverge more significantly than the oldest New York women from the patterns of the low-control Hutterite and Amish populations. This divergence is small at the lower parities, indicating that almost all women were still bearing at least some children and that the "modern" family of less than 3 children was quite unusual. But the divergence is more evident at the highest parities, suggesting that significant proportions of New York women 45-59 in 1865 were targeting a smaller family size and trying to control their fertility. Note, nevertheless, that in this sample of New York women 45-59 in 1865, the probability of another birth is still greater than 75 percent at each of the

reported parities, indicating little consensus on a specific family size target and implying (probably) low overall levels of conscious fertility control. In other words, these New York women were quite varied, compared to contemporary women, in the levels of reproduction. While a significant number were making serious efforts to control their fertility, a significant number were also making few efforts in this direction. In addition, there was little evidence of a consensus "stopping" point for reproduction.

Further evidence on the emergence of birth control and restricted family size is evident when we compare in Figure 2 the New York women 45-59 in 1965 with the New York ever married, native born women 45-59 who appeared in the 1900 public use sample that was drawn at the University of Washington (Graham 1980). In 1865, these women were unmarried children or recently married young adult women. The New York women in the 1900 sample represent all counties of New York, including the five counties that eventually comprised New York City (exclusion of these counties made hardly any difference in the patterns).

While the pattern for the women 45-59 in 1900 (born approximately between 1841 and 1855) does not form a smooth curve (possibly due to the sample size), it has a peculiar overall shape that is echoed to some degree by later populations in the figure. In particular, parity progression ratios decline steeply at the lowest parities, but then tend to level out. This suggests that a significantly higher share of these New York women were effectively achieving replacement or below-replacement fertility by the late 1800s, but high proportions of other couples are still apparently making few efforts in this direction, and continue to have a high probability of additional births at high parities. One cannot know whether the emergence of extremely small and moderate sized families was due to changing family size desires, but it is noteworthy, as others have pointed out (Knodel and van den Walle 1979) that the late two decades of the 1800's

were marked in European society by the active publicizing of birth control techniques, the development of the diaphragm, and improved manufacturing of condoms.

The emerging nature of family formation in the 20th Century is further indicated by Ryder's (1969, 102) estimates of parity progression ratios for U.S. white women who were born in 1909 and 1933, years that reflect, respectively, the low fertility that occurred during the great Depression and the high fertility that occurred in the post-World War II baby boom. In form, both these curves are similar to that identified for the New York native-born women in the 1900 public use sample. The curves decline steeply at the lowest parities, but then level off or even increase at the higher parities. Again, the data suggest that American women in these cohorts were a combination of active controllers and passive controllers. The curve for the 1909 cohort is very similar in shape to the curve for the older New York native-born women in the 1900 public use sample, but at slightly lower overall levels of fertility. Consistent with our knowledge of the Baby Boom, the 1933 birth cohort actually has higher probabilities of another birth at the low parities than the 1909 birth cohort, but the progression probabilities continue to decline at the higher parities. In other words, as others have pointed out, much of the Baby Boom was due to the end of 0 and 1 parity women. Very large families continued to decline in importance.

HOME VALUE AND PARITY RATIOS

Previous research (Bash 1963; Guest 1981) on the New York state fertility transition found that the aggregate community value of homes was the strongest correlate of geographic variations in fertility. But, in the case of both studies, housing value was related to aggregate average fertility differences across all women, regardless of age. To investigate the role of home value in the fertility transition, we focus on the two age groups of older native-born women, between 45 and 59 and over 60 in 1865. As we have emphasized, the women over 60 seemed to

show little evidence of parity control while the women 45 to 59 indicated more significant levels, but still low by the standards of contemporary low fertility populations.

Figure 3 shows the parity progression ratios when the two age groups of women are further subdivided into high and low home value groups by the average value of their town. The major factor influencing the curves in Figure 3 seems to be the birth period of the women. Regardless of the average value of dwellings, the younger women exerted more parity control than the older women. This indicates the degree to which fertility control seemed to diffuse across all types of communities, although the average value of dwellings in 1865 could be considered only a very crude indicator of the actual living conditions in the towns when women bore their children.

FIGURE 3 ABOUT HERE

Nevertheless, among the women 45-59 in 1865, the average value of housing dwellings makes a noteworthy difference in the parity progression ratios. At all parities except those indicating the transition to the first and seventh births, the wealthier communities have a lower probability of progressing to another birth. Of particular interest is the fact that the two curves largely parallel each other, indicating a relatively uniform "wealth" effect on whether women have another child. In other words, women in the wealthier communities show little tendency, relative to women in the poorer communities, to pick a specific parity as a stopping point for their reproduction.

While the differences in parity progression ratios are quite evident, they tend to be small, and even in the wealthier communities, high proportions of the women "progress" to higher parities. At all parities in the wealthier communities, over 70 percent of the women at each parity have at least one more birth. The data again underline the fact that even the most well-to-do communities must have had wide internal variations in efforts or ability to control births,

especially by the standards of contemporary 21st Century populations.

The patterns for the oldest women, over 60 (who practiced little parity control), show little consistent relationship with their town's home value, which may be partially a reflection of the often small sample sizes at various parities and the resulting low degree of reliability for the patterns. There is virtually no overall difference in progression ratios by community wealth level at the lowest parities. Furthermore, progression ratios are actually higher for the transition to the third and fourth birth in the well-to-do communities. However, at the highest two parity levels, the progression ratios tend to be lower in the more wealthy communities. The data, therefore, imply that community wealth made little overall difference in fertility control before the transition clearly unfolded, but then emerged as an important predictor once the transition was well underway.

VARIATIONS IN REPRODUCTIVE PERIOD

Of particular interest is the question of whether women, across townships, responded in their fertility behavior to different aspects of the social structural situation in which they lived. One possibility is that reproductive behavior responded only to the characteristics of the women, their husbands, and the immediate household. Another possibility is that reproductive behavior was influenced by the characteristics of the community in which they lived, such as its economic standards of living, urbanization, and the availability of farmland. An important but unanswered question in the study of fertility transitions, both historical and contemporary, is whether changes in reproductive behavior basically follow a model in which individual households change their calculus about fertility behavior or a model in which broad social changes in the society lead to collective adaptations (Hirschman and Guest 1990). Previous research on fertility behavior in the 19th Century has primarily been based on aggregate patterns, rather than a combination of

household level and community characteristics.

For this final part of the analysis of the microdata, the sample consists of native born wives between the ages of 30 and 44, who report themselves as married only once and are listed along with their spouse in the census manuscripts.(6) Since these women are in the later stages of reproductive fecundity, they have a relatively high probability of making fertility decisions in the environments where they lived in 1865. For most populations, age differences in fertility are most evident in the later stages of the reproductive cycle when some couples have achieved their desired family sizes and try actively to control reproduction, while other couples do not practice family limitation. Since we are interested in marital fertility, a cut-off of 30 years of age seems appropriate to investigate fertility during the past four years or so; women who married in their late 20s would not have the same opportunity to bear children during the previous four years as other married women. We have also restricted the sample to women who lived outside Poughkeepsie and Troy, the two largest cities in data set. In the subsequent section, we consider measures of town agricultural organization, but these were not relevant for cities (or their wards) as large as these. (7)

Two dependent variables will be used: first, the number of children ever born that are reported for the women; second, the number of surviving own children 0-4, as determined by matching mothers with their children in the census manuscripts. While the number of own children 0-4 is a useful variable to indicate recency of childbearing, it also may suffer from problems of reliability. Children 0-4 are only those enumerated at the time of the census; some may not have lived with their mothers, but more importantly, the substantial mortality rates for young children at the time (Haines 1977) suggest that many births were probably not captured by this number. This is especially likely to be a problem in interpreting socio-economic and wealth differences in

childbearing. Households from the lower rungs of the stratification system were likely to experience disproportionate child mortality, reducing own children 0-4 relative to those who were ever born.

Our analysis proceeds by specifying four types of individual/household effects that might affect fertility behavior. Table 4 shows how these variables are related to fertility in models that include all the predictors.

TABLE 4 ABOUT HERE

First, a basic demographic model includes the age of the women which will have obvious, important effects on fertility, due both to declining fecundity with age and to increasing levels of fertility control among some women as they age. In addition, we have included a dummy variable in this model to indicate women who reported a husband as serving in the military during the Civil War, either at the time of the census or previously. It could be argued that the absence of husbands reduced fertility artificially in various parts of New York State at this time. However, the importance of this variable should not be overemphasized. Only 8.5 percent of the 706 women in the sample reported a husband in military service. As in most wars, military service drew heavily from the unmarried men below 30 in age.

A second model emphasizes the possible importance of socio-economic position of the husband in fertility variations. We divide the households by the occupation of the husband, using the occupational coding scheme of the 1950 U.S. Census. White collar includes professional, managerial, clerical, and sales; skilled blue collar includes skilled manual workers (craftsmen and foremen). The two other occupational categories are other blue collar workers (operatives, service and household, and laborer) and agricultural (farming). Not surprisingly, the modal category is agricultural, but it does not include the majority of the sample. New York was

clearly in transition to an urban-industrial economy. To these categories, we add an "other" category that includes unclassifiable and non-occupational responses (e.g., student, landlord, retired, gentleman).

Unfortunately, the 1865 census does not report data for everyone on levels of schooling attained. However, for husbands, we can determine whether they could read and write, although the vast majority of native New Yorkers were literate. Husband's literacy was somewhat problematic, since it technically only applied to the voting population (males aged 21 and over) but was often reported for younger males. This variable appears, from the census manuscripts, to have been collected haphazardly for women.

A third model emphasizes the role of the family's socio-economic position in fertility variation. A crucial indicator is the value of the home (whether owned or not), a variable that was found to be a powerful correlate of fertility in previous work on New York state fertility by Guest (1990) and Bash (1963). In addition, we determine the number of female persons, associated with each family, that are listed in servant roles or as non-employed relatives between 25 and 85, with the obvious expectation that couples with live-in help are probably well off financially. Of course, servants may also be necessary when the wife has a large number of children.

A fourth model posits that variations in fertility reflected the geographic origins of the households. For both men and women, we can determine whether they were born in one of the New England states, the part of the United States that probably had the earliest fertility decline among the major regions. New York State was a major destination for the large westward flow of migrants from the New England states. In addition, we determine whether the husbands were born abroad (the sample includes only native born women). This model emphasizes the

importance of historical origins, rather than current situation, in understanding fertility variation.

Four multiple regression analyses are found in Table 4, two for children ever born (CEB) and two for own children 0-4. The first regression for each dependent variable includes only the family and individual-level variables, while the second regression also includes community/town variables. The regression coefficients are stated in unstandardized form. Most of the standardized coefficients were quite small (below .10) and are available upon request. The coefficients in the first equation for each dependent variable changed very little when the community variables were included in the analysis.

Two of the variables, husband's occupation and value of family housing, are coded as multiple dummy variables. The respective omitted values (not included in the regressions) are husbands with a non-coded occupational response and non-reported housing value. For these variables, the regression coefficients for each included response indicate the size of fertility levels above or below those of the omitted category. As an example, women who are married to white collar workers have .063 more children ever born than women who are married to those with a non-coded response, controlling for other variables. Women who are married to craftsmen and foremen have .571 more children ever born than women who are married to those with a non-coded response, controlling for other variables. This means that wives of skilled blue collar workers have about half a child more than wives of white collar workers (.571-.063=.508).

As measured by levels of statistical significance and standardized coefficients, the most important predictor of fertility in all equations was the age of the woman. As expected, an older age was associated with more children ever born but lower recent fertility. Another conceptually key variable, service in the military, seems to have little influence, especially on lifetime fertility. Overall, service in the military during the Civil War had little influence on our results.

While the relationships of the other variables to fertility behavior are generally consistent with expectations, only one achieves statistical significance, by conventional standards at the .05 level, one-tailed F-test. Households in especially valuable homes have relatively low numbers of children ever born. The same general pattern is evident in predicting children 0-4, although it is not statistically significant at the .05-level. In a sense, the lack of statistically significant coefficients is disappointing since it indicates limited success in identifying strong social correlates of the fertility transition. But it does point to an important conclusion which is implicit in our previous analysis, namely, that specific types of women and families differed greatly at this time in the degree to which they seemed to exert control over their fertility behavior. Thus there is a very large amount of unobserved heterogeneity.

Yet, a number of the variables are useful for distinguishing variations in fertility. This is especially true in regard to children ever born. In predicting children ever born, white collar occupational status (as opposed to agricultural or blue collar work) is associated with low fertility. In addition, literacy among men (as opposed to illiteracy), land ownership, and the presence of female household help are all associated with low fertility.

The patterns with these variables are generally consistent for predicting children 0-4, but the relationships are weaker than found for predicting children ever born. The one exception is husband's occupation which seems to have hardly any relationship with children 0-4. As noted earlier, the weaker relationships for children 0-4 may reflect differential infant and childhood mortality by some of the key predictors. White collar, blue collar, and agricultural workers probably ended up with about the same number of surviving children, although they differed in terms of children ever born.

Variables measuring geographic origins also have some usefulness for distinguishing fertility

levels. The variables are consistent in their patterns, but stronger in relationships for children ever born. Having a husband of foreign (as opposed to native) birth increases the average number of children by .86. The New England birth of the mother or father has separate effects of over .4 children per parent in decreasing children ever born, so that having both New England born spouses is predicted to decrease children ever born by almost one child.

ROLE OF COMMUNITY

One of the analytic virtues of the Census of 1865 is the large number of demographic, social, and economic characteristics that are reported by town. These allow us to test whether the socio-economic context played an important role in understanding variations in reproductive behavior beyond those attributable to the husband, wife, and household. Given the availability of data, we divide possible contextual predictors into the following groups:

First, we calculate the strength of what Leasure has called "individualist" religious orientation by measuring, separately, the strength of three numerically strong Protestant groups that might be identified as especially "individualist" within the New York context at the time, the Baptists, Methodists, and Universalists. Each emphasized the importance of individual conscience in being religious. For each group, we calculated the number of reported seats in churches of that denomination in relationship to the total population of the town. Leasure considered Congregationalist, Unitarian, and Quaker religious affiliation as individualistic, but the Unitarians and Quakers were numerically unimportant in New York at this time. Historically, Congregationalists formed the backbone of a semi-official Puritan Church in Massachusetts that had tried to restrict the religious and political liberty of competing Protestant and Catholic groups. At this time (1865), they had an informal alliance with Presbyterians, who were fellow-Calvinists.

Second, we consider the nature of the agricultural system, primarily the availability of inexpensive farmland. Two measures are used: the proportion of all farmland that is "improved", according to the state census, and the average value in dollars of an acre of farmland. Third, we consider the average wealth-holdings in the town, as measured by the percentage of households that report owning land and the natural logarithm of the average dwelling value. Fourth, we evaluate the importance of urban development of the town by measuring the percentage of the 1865 population that lives in urban places, according to the definition of urban in 1875 as applied to the 1865 population.

Most of these contextual variables correlated quite poorly with individual level fertility for native women 30 to 44 years old, with few of the zero-order Pearsonian correlation coefficients arising above .10. This again reflects the great variation in parity within communities, just as there was great variation across types of women and families. A problem in selecting the best community predictors of fertility occurs because of the almost universally low and similar correlations with fertility variation and the often moderate to high intercorrelations of the predictors. In such cases, it is well known that relative effects are difficult to assess. For instance, slight measurement error in one predictor may cause it to "lose out" to other predictors that are better measured.

The limited power of the community-level variables is also indicated by inspecting the adjusted values of R-squared in the equations that include them as opposed to omitting them. In predicting children ever born, the R-squared increases from .100 to .108, while in regard to own children the R-squared value actually becomes less, .046 to .042. Thus, the similarity of fertility levels across New York state communities should be emphasized.

Especially surprising are the weak partial effects of the urbanization measures and the

indicators of community wealth. The regressions indicated that none of these variables were close to statistical significance, at the conventional .05 level, one-tailed F-test. This may seem surprising since parity progression ratios did differ, albeit moderately, between towns with valuable homes as opposed to less valuable homes for ever-married women 45-59. One plausible hypothesis is that most parts of New York had become integrated, to some degree, by 1865 into the emerging urban-industrial economy. For instance, the extensive canal system linked closely the more urban and rural parts of the state.

The strongest predictor of the community level variables was the proportion of improved agricultural land which (consistent with the land availability thesis) was a negative correlate of both measures of fertility. However, the only other predictor (significant at the .10 level for children ever born) is the value of an acre of farm land; areas of valuable farm land, contrary to the land availability thesis, actually having higher levels fertility.

FIGURE 4 ABOUT HERE

While the regression indicates some support for the land availability thesis, conclusions must be drawn cautiously. Figure 4 shows how the levels of the dependent variables change over various degrees of improved agricultural land. The impact of improved land seems to be almost completely at the low levels. At levels of improved land above 50 percent (a situation characterizing over 75 percent of the towns in the sample, there is no linear trend between the agricultural variable and the fertility measures. A high proportion of the towns with very low proportions of improved land were found in Steuben County (partially in the Allegheny Mountains) and Warren County (located in the Adirondacks). Many of these towns were geographically isolated and not closely linked to the most “modern” parts of New York at the time.

DISCUSSION

Examination of these microdemographic data from the 1865 census of New York State provides direct confirmation of fertility decline within marriage in early nineteenth century America, independent of the same trends that are suggested by census child-woman ratios. These results are more general than those provided by Bash (1955). While our data are primarily limited to retrospective data from age cohorts, New York native married women in the reproductive ages in the first part of the 19th Century had high probabilities (over 60 percent) of bearing at least seven children, while only about 20 percent of the women completing childbearing at the time of the Civil War had as many as seven children. These estimates may be affected by selective survivorship by parity, selective recall of older women, and by changes in the age at marriage, but it seems that the differences are too great to attribute primarily to these factors.

Great caution is necessary in interpreting the New York decline as representative of the rest of the United States at this time. Child-women ratios by state for the entire country suggest that the lowest levels of fertility in the early to mid-19th century were found in the New England states especially, but also in the Middle Atlantic States, including New York. Nevertheless, this study does indicate that marital fertility decline was occurring in the most established and economically developed parts of the United States well before major declines in most European countries. The results should alert us to the need for being very cautious in making broad generalization about fertility decline in the United States, since there were quite varied internal patterns.

We should also emphasize the great cultural diversity in fertility within the New York sample. While we have primarily focused on the native born, patterns of fertility were quite different for

the foreign born who generally came from European countries that had shown little evidence of declining marital fertility. In 19th century New York, foreign born and native born lived nearby and shared a common European cultural background, but fertility behavior suggested somewhat independent family worlds. Even among the native born women, a foreign origin of the husband related to fertility variation, and couples from New England (with even lower fertility) were different from other native born couples who had less direct New England roots.

Even though the evidence supports strongly the idea of a New York marital fertility decline, the 19th century transition appears to be far different from the spectacular declines reported for countries such as Japan and Taiwan in the post-World War II period (Feeney 1991; Feeney and Feng 1993). In these countries, the decline (once begun) occurred dramatically and quickly. Cohorts of women altered significantly their fertility behavior within one or two decades so that families of several children virtually disappeared and few women were having more than three or four children. While there is extensive debate on why countries such as Japan and Taiwan had such rapid changes, it does appear that the availability of effective, accessible contraception such as the intrauterine device (IUD) was quite important.

In 19th century New York, the marital fertility decline saw the gradual emergence of wide variations in reproductive behavior among women, even in the geographic areas that had the social and economic conditions that should be most conducive to low fertility. In other words, the New York fertility decline reflected, to some degree, the emergence of what we know as the "modern" family where many couples probably made an active effort to control the total number of children. But significant proportions of couples continued to have quite high fertility by the contemporary standards of developed countries and rapidly developing countries such as Korea and Taiwan.

Our data cannot resolve the issue of why a significant proportion of couples continued to have such large families. Was it desire for large families, weak availability of effective techniques to control fertility, or some combination of the two? Certainly, the techniques of fertility control available to 19th century New York couples were rather primitive by today's standards, including abstinence, withdrawal, and crude condoms. Voluntary abortion was undoubtedly practiced, but legal opposition to it grew during the 19th century.

The New York patterns in the 19th century do fit fairly nicely into a general portrait of changing parity distributions in American society. We know that the emergence of a U.S. "modern" fertility pattern in the 20th century also involved the development of wide variations in reproductive patterns among American women. In addition, we know from 20th century surveys, that significant proportions of couples had large numbers of unplanned or unwanted babies while significant proportions were also quite successful in achieving small family goals. This U.S. pattern seemed to change in the 1960s with the development of such techniques as the IUD and the pill that reduced greatly levels of unplanned and unwanted fertility (Westoff 1981). Given these findings, there seems to be little doubt that the wide variations in parity in New York reflected, to at least a moderate degree, the wide variations in the practice of fertility control.

What were the economic and social forces that produced the New York fertility decline, as suggested by the 1865 data? It would certainly appear that the economic development of the state, as indexed perhaps by the value of housing, was a key underlying factor. This is supported by the differences in fertility that we have found among the older women in 1865 between those living in areas with high home evaluation as opposed to low evaluation. Yet, these differences by economic status, while real, were often muted by the very large differences in fertility within type of geographic area. Even among women living in the most economically developed parts of

New York, wide variations in reproductive behavior existed. This has some implications for the well-known debate about whether fertility transitions in the 19th century reflected adjustment to social structural conditions or the diffusion of information on how to control births (Knodel and van de Walle 1979). Our data suggest that social structure was quite important, but there was a very partial or incomplete response by many couples in the areas that should have been conducive to fertility decline, perhaps because the means to achieve fertility control were not very effective.

Consistent with Bash's analysis (1963), we have found that the value of housing decreased in predictive importance among the younger reproductive age women in 1865. Yet, by 1865, New York had become quite geographically integrated, especially by the building of the Erie Canal and auxiliary water and rail transportation, and the spirit of a booming capitalist economy may have penetrated most parts of the state. "Economic development" may have pervaded most parts of the state, including rural, agricultural areas, but many couples within areas may have lacked the motivation or techniques to control effectively their fertility.

The data from the seven county sample in 1865 have a limited potential for further analysis of the economic and social structural correlates of the New York fertility decline, but previous state and federal censuses contain extensive published data on age distribution by township that have a great research potential. These data may be turned into estimates of fertility through child-women ratios. Given the large number of New York towns, it should be possible to do much more multivariate analysis of how different types of communities participated in the fertility decline.

Unfortunately, the 1865 data do not permit much assessment of how various aspects of economic development influenced fertility behavior. In particular, the role of educational factors

in understanding the fertility transition is difficult to assess. Literacy was related negatively to fertility, but only a small proportion of the adult population was illiterate. It is impossible to determine directly school attendance rates by town, so we cannot assess directly the role of this factor. One possible indicator of educational influences is occupational differences in fertility; we have found that white collar families (probably with high educational aspirations for themselves or their children) had lower fertility than other occupational groups. But occupational differences were weak, and occupational groups had sizable internal variations in reproductive behavior, just as geographic areas did.

FOOTNOTES

1. The complete original set of 1865 schedules held by the state were apparently accidentally destroyed in a fire in Albany in 1911. Many duplicate copies were in the hands of county and town clerks, however. The principal ones missing are, unfortunately, for New York City (Lainhart 1992, pp. 85-88). New York state took censuses of the total population in 1814, 1825, 1835, 1845, 1855, 1865, 1875, 1892, 1905 1915, and 1925 (Dubester 1948), but the complete enumeration by the state of the population began only in 1855.

The relevant column on the 1865 census manuscript page in regard to children ever born was headed: "Of how many children the parent?" The instructions to the enumerators stated the following: "This inquiry is to be made on of adult females and usually of wives or widows. It should, in all cases, include the number of living children the woman has borne, whether now living or dead and whether present or absent from the family. These children may perhaps be themselves the heads of families, and residents of another State, or they may have died in childhood. The object of the inquiry is to obtain data for determining the natural increase of the population in this State among the various classes, and it should be taken fully and uniformly to possess value. Be careful to note in this column the number of children borne by females now aged, as well as that of those now surrounded by their families. We can thus determine the relative rate of increase of a former age, for comparison with the present." (New York State, 1867, p. lxvii.)

2. Among other studies dealing with fertility in the United States and which have used micro-census data for the period prior to 1900, see Stern 1987, Ryan 1981, Mason, Weinstein, and Laslett 1985, Zunz 1982, Haines 1979, Hareven and Vinovskis 1975.

3. The definition of urban in Table 1 is taken from the New York State Census of 1875 (New

York State, 1877, p. 9). Urban areas included (a) all areas designated as cities; (b) all towns adjacent to cities; and (c) towns containing villages of population over 1,000 population.

5. The Federal census first began collecting information on marital status or duration in 1880, but few of these women were of marriage age in the first part of the 19th Century. As a consequence, our knowledge of nuptiality levels and trends throughout the 19th Century is limited (Monahan 1951). One piece of research to approach this problem is the work of Sanderson (1979) who applied the Coale-McNeil nuptiality model (Coale 1971) to the American female population for the period 1800 to 1920 and made estimates of age at marriage. David and Sanderson (1987b) have developed a statistical technique to estimate the degree of fertility control in historical populations, but it cannot be applied to our data because marital duration is not available.

6. Households were taken as the primary enumeration units as defined in the manuscripts of the census. Families were subunits of households defined as a conjugal unit or the remains of a conjugal unit (i.e., a husband and wife, a husband and wife with one or more children, a husband or wife with children). Boarders and lodgers were considered as members of separate families. Resident servants were considered part of the primary household unless the servant was part of a resident conjugal unit or the remains of a conjugal unit, in which case they were assigned to a separate family. Such assignments to family units, as well as the matching of husbands and wives and mothers and children (necessary to own-children fertility estimation), were made using such information as name, age, sex, marital status, and relationship to head of household in the census manuscripts.

7. We also considered various other specifications such as making the dependent variable children 5-9 and including women of all ages. In general, regardless of the specification, most of

the community-level variables had weak effects on fertility. The strength of individual-level predictors differed slightly across specifications, but the general pattern of relationships was quite similar.

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Table 1. Characteristics of Selected Counties, New York, 1865 (a)

COUNTY	TOTAL POPU. (1865)	% URBAN	% FARMERS	AVERAGE HOME VALU	% ILLITERATE OVER 20	% AGRI. LAND IMPROVED	CEB NAT. WOM. 45+	CEB NAT. WOM. 30-44	C0-4/ W15-49
Allegany	40,285	7.62	62.08	0.42	1.00	54.25	6.1	3.4	451.1
Dutchess	65,192	50.17	27.72	1.52	3.30	78.31	5.4	3.9	420.4
Montgomery	31,447	69.51	32.08	1.11	3.10	83.02	5.9	3.6	438.3
Rensselaer	88,210	72.25	19.95	1.24	3.20	76.20	4.9	3.5	454.3
Steuben	66,192	27.66	50.94	0.55	3.30	55.44	6.3	3.5	483.4
Tompkins	30,696	35.09	42.84	0.74	1.30	74.36	5.2	3.0	355.4
Warren	21,128	36.08	50.08	0.44	3.60	41.62	6.5	4.3	543.8
NY STATE	3,831,777	62.99	27.92	1.85	not avail.	58.75	not avail.	not avail.	454.3

(a) Percent urban uses the 1875 New York Census definition.
Percent farmers is farmers as a percent of males 15-64.
Average home value is reported in thousands of dollars.
Percent Illiterate (cannot read and write), native born males over 20, is estimated from 7-county sample.
Percent agricultural land improved is (Total Improved Ag Land/Total Ag Land)*100.
CEB nat. wom. 45+ is average children ever born for ever married native women over 45.
CEB nat. wom. 30-44 is average children ever born for ever married native women 30-44.
C0-4/W15-49 is children aged 0-4 per 1000 women aged 15-49.

SOURCE: New York State Censuses, 1865 and 1875.

Table 2. Child-Woman Ratios. White Population, United States & New York. 1830-1875.

CHILDREN AGED 0-4 PER 1000 WOMEN AGED 15-49

YEAR	UNITED STATES	NEW YORK STATE	NEW YORK LESS NEW YORK CITY	SEVEN NEW YORK COUNTIES(a)
1830	781.0	699.8	727.2	732.3
1840	743.6	615.6	634.8	648.8
1850	613.3	493.5	510.3	511.9
1855 (b)	---	501.4	518.4	519.0
1860	627.0	507.9	514.0	501.8
1865 (b)	---	454.3	460.3	446.9
1870	562.1	436.4	---	---
1875	---	423.5	427.5	415.9

(a) Allegany, Dutchess, Montgomery, Rensselaer, Steuben, Tompkins, & Warren
(b) Total population.

SOURCE: U.S. Censuses of Population, 1830-1870. New York State Censuses of Population, 1855, 1865, 1875.

Table 3. Average Parity by Age, Residence, Nativity & Marital Status: Adult Women, Seven New York Counties, 1865. (a)

AGE	TOTAL	(N)	NATIVE	(N)	URBAN NATIVE	(N)	RURAL NATIVE	(N)	FOREIGN	(N)
ALL WOMEN										
15-19	0.1	752	0.0	668	0.0	278	0.1	390	0.1	84
20-24	0.6	777	0.6	646	0.5	281	0.6	365	0.6	131
25-29	1.5	687	1.4	537	1.3	234	1.6	303	1.9	150
30-34	2.6	589	2.3	415	2.1	148	2.5	267	3.3	174
35-39	3.4	486	3.0	356	2.6	141	3.3	215	4.3	130
40-44	4.4	444	4.1	330	4.0	135	4.1	195	5.4	114
45-49	4.6	383	4.2	301	3.6	113	4.6	188	5.7	82
50-54	4.9	276	4.9	217	3.8	83	5.6	134	4.9	59
55-59	5.3	229	5.2	182	4.9	61	5.4	121	5.7	47
60-64	5.7	215	5.7	171	4.8	52	6.0	119	5.8	44
65-69	6.1	108	6.2	94	6.4	35	6.1	59	5.6	14
70-74	6.1	83	6.4	67	5.8	31	6.9	36	4.8	16
75-79	6.2	63	6.7	46	7.1	13	6.5	33	4.9	17
80+	6.9	43	6.8	36	7.2	18	6.5	18	7.0	7
EVER-MARRIED WOMEN										
15-19	0.5	70	0.5	58	0.6	19	0.5	39	0.5	12
20-24	1.2	376	1.1	320	1.1	126	1.2	194	1.3	56
25-29	2.1	506	1.9	395	1.9	160	2.0	235	2.6	111
30-34	3.1	492	2.8	344	2.6	121	2.9	223	3.8	148
35-39	3.8	427	3.5	308	3.3	113	3.6	195	4.7	119
40-44	4.8	406	4.5	301	4.5	121	4.4	180	5.8	105
45-49	4.9	355	4.6	277	4.1	100	4.9	177	6.0	78
50-54	5.2	258	5.3	200	4.3	74	5.9	126	4.9	58
55-59	5.7	215	5.6	168	5.5	54	5.7	114	5.7	47
60-64	6.0	202	6.1	159	5.1	49	6.5	110	5.9	43
65-69	6.6	101	6.6	89	6.8	33	6.4	56	6.5	12
70-74	6.3	80	6.6	65	6.0	30	7.1	35	5.1	15
75-79	6.5	60	7.0	44	7.1	13	7.0	31	5.2	16
80+	6.9	43	6.8	36	7.2	18	6.5	18	7.0	7

(a) The counties are: Allegany, Dutchess, Montgomery, Rensselaer, Steuben, Tompkins, and Warren. N's are numbers of women.

SOURCE: Sample of census enumerators' manuscripts.

Table 4. Regressions with Fertility as the Dependent Variable: Seven New York Counties, 1865.

(a)

DEPENDENT	(1A) CEB		(1B) CEB		Children 0-4		Children 0-4	
VARIABLE	Coeff.	Signi.	Coeff.	Signi.	Coeff.	Signi.	Coeff.	Signi.
INDEPENDENT VARIABLES								
FAMILY LEVEL								
Constant	-1.664		-0.372		1.905	***	1.984	***
Wife's Age	0.167	***	0.163	***	-0.034	***	-0.034	***
Husband Military Service	0.010		-0.044		-0.030		-0.050	
Husband Foreign Born	0.836	*	0.695		0.289	*	0.292	*
Husband Born New England	-0.497		-0.527		-0.086		-0.101	
Wife Born New England	-0.461		-0.556		-0.162		-0.173	
Husband's Literacy	-0.866		-0.862		-0.060		-0.043	
Husband's Occup.								
White Collar	0.063		0.121		0.185		0.190	
Crafts/foremen	0.571		0.542		0.156		0.156	
Other Blue Collar	0.548		0.572		0.141		0.147	
Agricultural	0.358		0.403		0.166		0.159	
Other Responses	NI	NI	NI	NI	NI		NI	
Household Help	-0.251		-0.240		-0.131	**	-0.127	*
Value of Home ($00's)								
$0-$499	-0.272		-0.235		0.018		0.031	
$500-$1,499	-0.212		-0.242		0.035		0.051	
over $1,500	-1.042	***	-1.015	***	-0.102		-0.073	
No Value Reported	NI	NI	NI	NI	NI		NI	
Landownership	-0.131		-0.141		-0.077		-0.093	
TOWN LEVEL								
% Baptist			-0.550				-0.091	
% Methodist			0.146				-0.026	
% Universalist			-3.515				0.033	

%Improved Agric. Land			-2.104	***			-0.378	*
Avg. Value Farm Acres			0.008	*			0.001	
Log of House Value			-0.001				0.029	
Pct. Own Land			-0.109				-0.020	
Urban Residence			-0.103				-0.102	
Mean, Dep. Var.	3.637		3.637		0.663		0.663	
Stand. Dev., Dep. Var.	2.576		2.576		0.781		0.781	
N	706		706		706		706	
Adjusted R-squared	0.100		0.108		0.046		0.042	
F-ratio	6.217	***	4.72	***	3.288	***	2.343	***

Significance: *** = significant at least at a one percent level; ** = significant at least at a five percent level; * = significant at least at a ten percent level.
NI = not included.

Figure 1. CEB for Female Cohorts

New York State Census, 1865

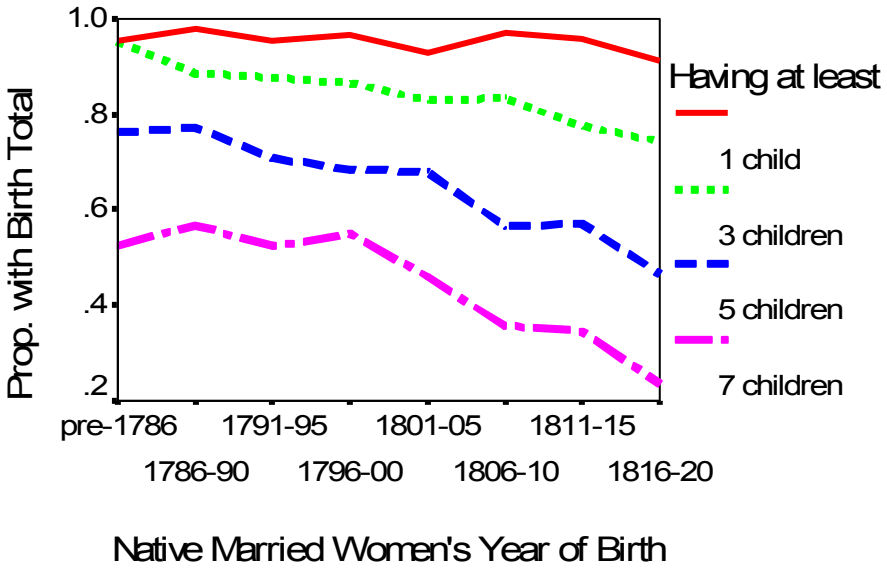


Figure 2. Parity Prog. Ratios

For Various Populations

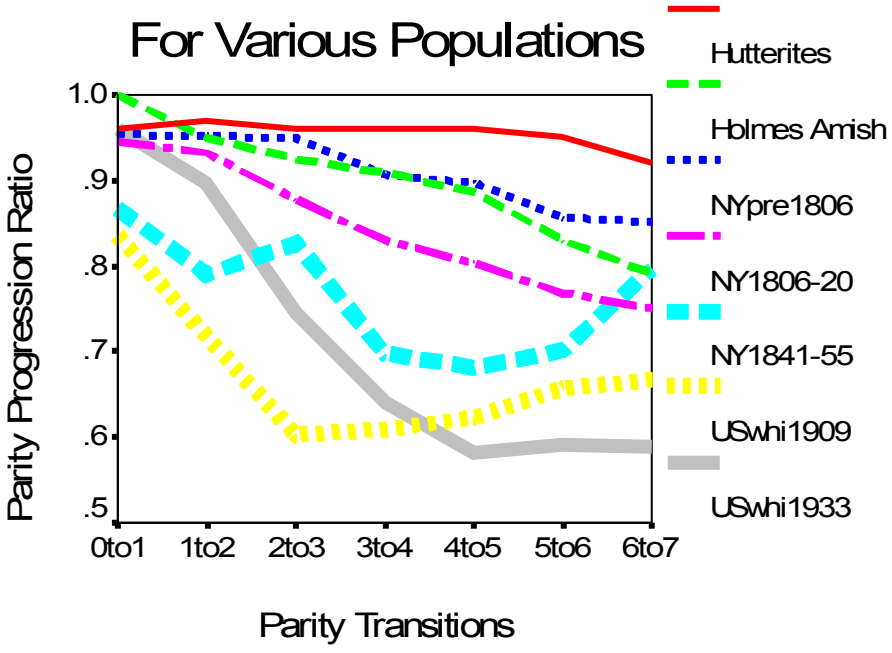
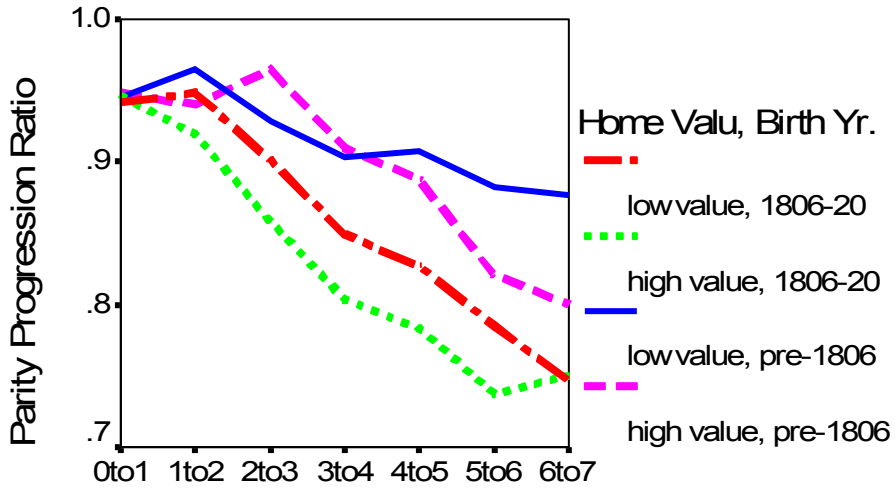


Figure 3. Parity Prog. Ratios

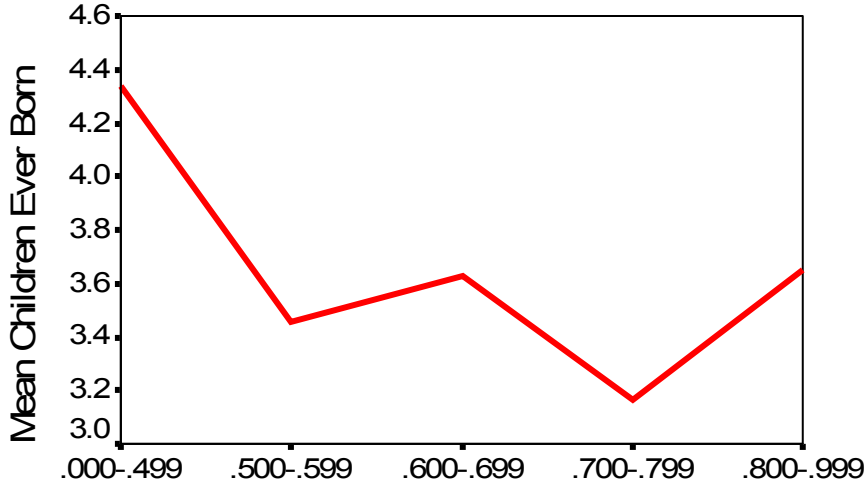
By Age Group & Housing Value



Parity Transitions for Native Ever Married Women

Figure 4. Town Farmland and CEB

Native Women 30-44



Town Proportion Improved Agricultural Land