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Ready, Willing, and Able? Impediments to the Onset of Marital Fertility Decline in the United States

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Abstract

This study relies on IPUMS samples of the 1850, 1860, 1870, and 1880 censuses, aggregate census data, and the timing of state laws criminalizing abortion to construct regional estimates of marital fertility in the United States and estimate correlates of marital fertility. The results show a significant lag between the onset of marital fertility decline in the nation's northeastern census divisions and its onset in western and southern census divisions. Empirical models indicate the presence of cultural, economic, and legal impediments to the diffusion of marital fertility control and illustrate the need for more inclusive models of fertility decline.

Keywords

Fertility decline; IPUMS; Religion; Abortion; United States

Introduction

The onset of fertility decline in the United States is an enduring puzzle in demographic history. According to the most widely cited estimates (Coale and Zelnik 1963), the decline began circa 1800, well before significant industrialization, urbanization, and the onset of the mortality transition. Beginning with Yasuba's study of the 1800–1860 decennial censuses (Yasuba 1962), which correlated state differences in child-woman ratios to the availability of land for farming, successive generations of scholars have generated a rich set of theories explaining the decline. Poor-quality data, however, have provided a weak empirical base to test hypotheses. The onset of fertility decline, its causes, and explanations for large and persistent regional differences in fertility remain contentious issues in the literature (Haines 2000).

The recent creation of IPUMS samples for the 1850–1880 censuses (Ruggles et al. 2010) has helped clarify some parts of the puzzle. Hacker (2003) showed that the national decline in child-woman ratios prior to 1860 was driven by declining nuptiality and increasing mortality. Marital fertility decline did not commence until the outbreak of the American Civil War (1861–1865) and was therefore not as "early" as long claimed (Smith 1987). Haines and Guest's analysis of microdata from the New York State census of 1865 found

modest marital fertility decline prior to the mid-nineteenth century despite rapid economic and commercial development following the opening of the Erie Canal in 1825 (2008). These results support Caldwell's contention that the true puzzle of fertility decline in the United States—and fertility decline in English-speaking countries more generally—is its late onset relative to the decline in France, despite similar or higher net costs of children (Caldwell 1999).

This study relies on the 1850–1880 IPUMS samples, aggregate census data (Haines and Inter-university Consortium for Political and Social Research 2004), and recent research on the passage of state laws criminalizing abortion (Lahey 2014a) to make two contributions to research on fertility decline in the United States. First, own-child estimates of fertility and marital fertility are constructed for the nation's white population to determine regional differences in fertility and regional patterns of fertility decline.[1] Total fertility rates, marital fertility rates, the index of marital fertility, and Coale and Trussell's (1978) index of parity-dependent fertility control are estimated by census division for the first time. These results indicate a significant lag between the onset of marital fertility decline in the nation's northeastern census divisions and western and southern census divisions.

Second, this study estimates correlates of marital fertility shortly after the onset of its sustained decline, focusing on the identification of impediments to the diffusion of marital fertility control. Discussion follows Coale's "ready, willing, and able" (RWA) preconditions for the onset of sustained fertility decline: (1) couples must perceive smaller families as economically advantageous (i.e., couples must be *ready*); (2) the practice of marital fertility control must be ethically acceptable (i.e., couples must be *willing*); and (3) the means to control fertility must be known and available (i.e., couples must be *able*). Depending on the particular context, any one of the three preconditions could be the slowest moving and act as a bottleneck to the onset of fertility decline (Coale 1973; Lesthaeghe and Vanderhoeft 2001).

It is important to emphasize that the 1850–1880 IPUMS samples and associated data sets used in this study—like the vast majority of historical data—have limitations. By necessity, analyses must rely on explanatory variables with ambiguous theoretical interpretation and proxies rather than direct measures of religion and religiosity. Good instrumental variables and a few independent variables of theoretical interest are unavailable, and there is some risk that coefficients are biased by endogeneity. Given these data limitations, no attempt will be made to estimate causal relationships.

The IPUMS samples, nonetheless, represent a substantial improvement in quality and coverage compared with data used by earlier researchers, and they are generally well suited for evaluating couples' readiness, willingness, and ability to limit fertility. Most prior studies of nineteenth century fertility have relied on aggregate child-woman ratios at the state or county level and a small number of independent variables; the IPUMS allows fertility to be measured at the level of individual women and includes a larger number of relevant economic, demographic, and cultural covariates. Occupation, wealth, and children's school

[1]The majority of the nation's black population in 1850 and 1860 was enumerated on separate slave schedules in the census, which lacked the necessary information for own-child analysis and model estimation.

attendance data from the IPUMS, for example, can be combined with county-level data on the average value of farms to construct a more comprehensive test of couples' readiness than possible with farm prices alone. Parents' choice of biblical or secular names for their children and county-level data on religious denominations can be used to construct proxies of religion and religiosity to determine whether couples' lack of willingness was a significant bottleneck to the practice of marital fertility control. Nativity data provide additional data related to couples' willingness. Finally, variations in the timing of state statutes regulating abortion in the mid-nineteenth century (Lahey 2014a; Quay 1961) can be used to test whether legal restrictions on the practice of induced abortion delayed the onset of marital fertility decline. Although the precise contribution of changes in couples' readiness, willingness, and ability to limit fertility cannot be estimated, the results suggest that all were important to the timing, pace, and spatial patterns of U.S. fertility decline.

Prior Research

Prior research on the onset of fertility decline in the United States has emphasized the importance of changes in couples' readiness. Because the U.S. Census Office cross-tabulated the population by age, sex, and county between 1800 and 1860—together with various demographic, economic, and social statistics—child-woman ratios have proven useful in estimating geographic differences in and correlates of antebellum fertility (Carter et al. 2004; Easterlin 1976; Easterlin et al. 1978; Forster and Tucker 1972; Haines and Hacker 2011; Leet 1977; Smith 1987; Vinovskis 1976; Yasuba 1962). The dominant interpretation that has emerged from these studies is that spatial differences in child-woman ratios were the result of couples' adaptation to the declining availability of land for farming. Increasing population densities led to a long-term decline in the availability of good farm land and a long-term increase in the cost of viable farms, especially near the Atlantic coast and navigable rivers where population densities were highest. As parents increasingly found themselves unable to endow their children with adequate farmsteads nearby (a highly desired outcome in an era in which old-age insurance was largely in the form of children to care for aged parents), they adapted by limiting their fertility (Easterlin 1976; Easterlin et al. 1978). Couples with greater land availability, on the other hand, had less incentive to curtail childbearing. A recent study of Georgia's Cherokee Land Lottery of 1832 showed that winners had slightly more children in 1850 than nonwinners (Bleakly and Ferrie 2016). Although alternatives to the "land availability/target-bequest" hypothesis have been suggested (Bean et al. 1990; Carter et al. 2004; Craig 1993; Steckel 1992; Sundstrom and David 1988), most hypotheses assume that children represented a normal consumption good and that fertility decline was an adaptation process driven by declining agricultural opportunities.

Research on the post-1860 period has also emphasized couples' economic motivations to reduce fertility but has focused on the contributing roles of urbanization, industrialization, higher incomes, and compulsory schooling (Guest 1981; Guest and Tolnay 1983; Wanamaker 2012). Although evidence is limited, most investigators of the North American and European fertility declines have assumed that fertility was positively correlated with income, wealth, and socioeconomic status prior to the onset of the fertility transition (e.g., McInnis 1977; Steckel 1985) and negatively correlated after its onset (e.g., Becker and

Lewis 1973), suggesting diverse and changing quantity-quality tradeoffs (Dribe et al. 2014a). Evidence on when and how the income/wealth and fertility relationship changed in the United States is mixed. Wahl's analysis of genealogical data linked to wealth data in the 1850–1870 U.S. censuses indicated a complex relationship between wealth and fertility. Fertility was negatively correlated with wealth at low levels of wealth, positively correlated at moderate levels of wealth, and negatively correlated at high levels (Wahl 1986, 1992). In their analysis of children ever born and occupation data in the 1900, 1910, and 1940–1990 IPUMS samples, however, Jones and Tertilt (2008) found a consistent negative relationship between fertility and "occupational income" from the earliest observable birth cohort in 1826. Other researchers have highlighted large and increasing occupational differences in fertility in the late nineteenth century, especially between women married to men in farm and nonfarm occupations (Dribe et al. 2014b; Haines 1992; Stevenson 1920). These studies suggest that the predicted relationship among occupation, wealth, and fertility—at least during the early part of the fertility transition—is unclear and needs further investigation.

Social historians have stressed the importance of changes in couples' willingness to control fertility. Rapid social, religious, and political change following the American Revolution led to new ideas about sexuality, health, education, and the role of women in society and the family, allowing the idea of smaller families and the practice of contraception to become socially acceptable (Degler 1980; Klepp 2009; Smith 1974). Nineteenth century and early twentieth century observers identified the foreign-born population as the group most resistant to the new idea of small families and the practice of contraception, while members of the native-born white population were identified as the earliest adoptees (King and Ruggles 1990; MacNamara 2014; Smith 1994). Quantitative historians have found large fertility differences by nativity and among first- and second-generation immigrants, even after controlling for socioeconomic status and residential factors (Atack and Bateman 1987; Forster and Tucker 1972; Hareven and Vinovskis 1975; King and Ruggles 1990; Leet 1977; Morgan et al. 1994; Vinovskis 1976, 1982).

Couples with deeply held traditional religious beliefs may have considered the practice of marital fertility control taboo. The biblical account of Onan was interpreted by many nineteenth century Americans as an admonition to avoid *coitus interruptus*, the most accessible and effective method of birth control (other than abstinence) in the preindustrial era (Santow 1995). Opponents of birth control in the nineteenth century labeled the practice of withdrawal as "conjugal onanism," while early advocates for contraception tended to be religious "free thinkers," members of liberal churches, or atheists (Brodie 1994:59; Smith 1994). There is, however, little direct evidence of religious dogma directed at the practices of contraception and abortion. Historians have commented on the rare participation of churches and ministers in the anti-abortion and anti-contraception campaigns of the nineteenth century (Brodie 1994; Graebner 1969; Mohr 1978; Tentler 2002), but also have noted that no major church denomination in the United States took an accepting position toward the use of contraception before the Federal Council of Churches of Christ in America endorsed the use of birth control in 1931 (Kennedy 1970). The available evidence suggests an indirect role of liberal churches in promoting positions of authority for women, secular individualism, and new behaviors and of evangelical and conservative churches in reinforcing traditional family

values and segregated gender roles (Goldscheider 2006; Lehrer 2004; Lynch 2006; McQuillan 2004; Parkerson and Parkerson 1988).

Only a few quantitative studies have attempted to assess the importance of religion in the early stages of the U.S. fertility transition. Parkerson and Parkerson (1988) found significant differences in fertility between women of "pietistic" and "liturgical" religious orientations in their study of St. Charles, Illinois, in 1885. Leasure (1982), Smith (1987), and Haines and Hacker (2011) reported a negative relationship between antebellum child-woman ratios and the proportion of church seats held by "liberal/pietistic" religious denominations. Hacker (1999) also reported a negative correlation between marital fertility and couples' reliance on secular names for their children in the 1850 and 1880 IPUMS samples. Parental choices of biblical or secular names for their children's names, he argued, are a reasonable proxy of parental religiosity in the mid-nineteenth century United States, where parents were largely free to name their children without state or church restrictions and which was experiencing a rapid secularization of the naming pool.

There is no systematic evidence on how nineteenth century Americans limited family sizes or the effectiveness of nineteenth century birth control methods, making it difficult to assess whether couples' ability to control their fertility changed over time. There is evidence to suggest that knowledge of the basic reproductive process and the effectiveness of abstinence and withdrawal were widespread prior to the onset of marital fertility decline (Brodie 1994). For couples willing to ignore its biblical condemnation, withdrawal had the virtues of being readily available and effective (Dalla Zanna et al. 2005; Guinnane 2011; Jones et al. 2009), especially when combined with reduced coital frequency or periodic abstinence (David and Sanderson 1986). Withdrawal attracted significant criticism from mid-nineteenth century health reformers, however, who warned that the practice was deleterious to men and women's physical and mental health, and from advocates of alternative contraceptive methods, who alleged that it was difficult to practice, lacked certainty, and lessened sexual pleasure (Brodie 1994; Haller and Haller 1974; Tone 2001).

Between the early 1830s—when Robert Dale Owen and Charles Knowlton published birth control tracts respectfully advocating the use of withdrawal and douching to control family size—and 1873—when the federal Comstock Act made it a crime to advertise, sell, or mail contraceptive advice literature and products—couples in the United States had legal access to an incipient market for contraceptive information and products, including douching syringes, douching solutions, pessaries, cervical caps, sponges, and condoms (Brodie 1994; Knowlton 1832; Tone 2001). The expansion of alternative methods suggests an increase in couples' ability to control fertility and in women's ability to control fertility independent of their husbands (van de Walle and de Luca 2006). Unfortunately, many of the new methods promoted by contraceptive entrepreneurs were ineffective, were less effective than withdrawal, or entailed significant financial or psychic costs (Brodie 1994; Hatcher et al. 2004:792; Jones et al. 2009; Rengel 2000:65–66; Santow 1998; Tone 2001; van de Walle and de Luca 2006). If couples followed reformers' advice to abandon withdrawal in favor of newer methods, their ability to prevent pregnancies may have suffered. Failed contraception led some women to induce abortion, which was legal in the early nineteenth century if practiced prior to "quickening"—the first felt movement of the fetus in the womb at about

four months gestation. Feminist historians have contended that abortion was relatively safe, socially tolerated, and routinely used by married women to control family size (Brodie 1994; Gordon 1990; Klepp 1994, 2009; Reagan 1997). Based on his reading of contemporary testimony and declining child-woman ratios in the nineteenth century, Mohr speculated that the abortion rate rose from about 1 in 25 or 30 live births in the first three decades of the nineteenth century to 1 in every 5 or 6 live births in the 1850s and 1860s (Mohr 1978). In response to this perceived trend, however, the right to legal abortion came under attack. Connecticut was the first state to pass a statute criminalizing abortion in 1821. By 1868, 30 of the 37 states had enacted an abortion statute, and all states had a law in place or enforced common law restrictions before 1900. Most were explicit in outlawing abortion regardless of term, but a few applied only to the period after quickening (Dellapenna 2006). According to Brodie, state statutes—while not eliminating the practice entirely—drove abortion underground, “making it far more difficult, expensive, and dangerous to obtain” (Brodie 1994:255).

Only one researcher has attempted to quantify the impact of couples’ changing legal access to abortion on nineteenth century fertility. In two published analyses of child-woman ratios in the period 1850–1910, Lahey (2014a, b) concluded that fertility rates were 4 % to 15 % higher in states where abortion was restricted by state statute. Lahey’s results for the late nineteenth century are approximately the mirror image of results reported by researchers for the impact of the legalization of abortion on fertility in the late twentieth century United States. Based on their analysis of state variations in the timing of abortion legalization between 1971 and 1973, Levine et al. (1999) estimated that legalization reduced births by about 11 %.

New Regional Estimates of Marital Fertility Using the IPUMS Census Samples

New IPUMS samples for the 1850–1880 censuses (Ruggles et al. 2010) represent a major increase in the quality of data available for description of nineteenth century fertility trends. I relied on the IPUMS samples, own-child estimation methods (Cho et al. 1986), new decennial life tables (Hacker 2010), and new estimates of census underenumeration (Hacker 2013) to construct national and regional fertility estimates for the white population. The inclusion of marital status in the IPUMS samples—imputed in the 1850–1870 samples and enumerated in the 1880 sample—allows estimation of marital fertility rates and the construction of popular indexes of marital fertility (Ruggles 1995).

The new estimates are shown in the figures. Figure 1 shows national and regional estimates of the total fertility rate. Figure 2 shows estimates of the index of marital fertility (I_g), a measure based on the marital fertility rates of Hutterite women between 1921 and 1930 (Coale and Watkins 1986). Figure 3 plots Coale and Trussell’s m parameter (Coale and Trussell 1978), an index indicating the degree of parity-dependent control (i.e., “stopping” behavior) characteristic of modern populations. The figures indicate that the total fertility rate for the white population in the nation as a whole declined 26 % in the 30-year period, from 6.1 children per woman in 1850 to 4.5 in 1880. (Total marital fertility fell by 22 % in

the same period, from 8.3 children per married woman to 6.5.) With the exception of the short-term recovery in the late 1860s from the birth deficit caused by the American Civil War (1861–1865), fertility decline was slow and relentless. Although marital fertility declined at all ages, the proportionate decline was larger in older age groups. Marital fertility among women aged 40–44 fell by 55 %; among women aged 20–24, the decline was 16 %. The increasing tendency of couples to stop or reduce childbearing at older ages is reflected in the *m* parameter (1978), which increased from 0.13 in 1850 to 0.31 in 1880.

Princeton's European Fertility Project (EFP) (summarized in Coale and Watkins 1986) suggested several guidelines for interpreting the fertility indexes. An index of marital fertility less than 0.6 or a decline in the index of 10 % or more indicates the presence of deliberate marital fertility control. Values of *m* lower than 0.2 suggest the absence of parity-dependent fertility control (Coale and Trussell 1978). According to these interpretations, the estimates indicate little deliberate marital fertility control in the nation as a whole until after the Civil War. The *m* value first exceeds 0.2 in 1866 and 0.3 in 1872, suggesting an onset of parity-dependent marital fertility control in the late 1860s. The index of marital fertility did not fall below 0.6 until 1879. These results suggest that the onset of marital fertility control was later than assumed by researchers relying on child-woman ratios. The steady increase of *m* from circa 1850 and the known tendency of *m* to understate the presence of a minority of controlling couples in populations with low contraceptive effectiveness (Okun 1994), however, suggest the growing prevalence of parity-dependent control from the middle part of the century. Overall, marital fertility decline in the United States began late relative to the decline in France—which, according to Weir (1994), began in the 1790s—and late relative to prior assumptions, but early compared with the typical European experience (Coale and Watkins 1986; Caldwell 1999). The evidence also suggests that parity-dependent control was accompanied or preceded by increased spacing of children.

The national results obscure significant variations by census division, however. All three figures indicate a large birth deficit in southern census divisions during the years of the Civil War related to the higher participation rates of southern men in the conflict (McPherson 1988). More importantly, the figures confirm that couples in the north-eastern United States were on the vanguard of marital fertility decline. The total marital fertility rate for New England women in the 1850s was 0.8 children fewer than that estimated for women in the Middle Atlantic census division, and 1.4 to 2.9 children fewer than the average among women in other divisions. Despite low marital fertility rates, however, *m* values in New England and the Middle Atlantic census regions indicate little evidence of parity-dependent control until after 1850. If women in the Northeast were consciously controlling their fertility in the first half of the century, they were doing so by increasing the length of the intervals between births at lower parities (Main 2006).

Despite valid criticisms of the fertility indexes developed for the European Fertility Project (e.g., Guinnane 1994; Okun 1994), the steady increase in *m* between 1850 and 1880 and large regional differences in *m* leaves little doubt that parity-dependent control was increasingly common among U.S. couples after the mid-nineteenth century. The practice appears to have become popular first in New England, followed by the Middle Atlantic census division and, after the war, the East North Central division. There is little evidence of

parity-dependent fertility control in the three southern census divisions and the West North Central division until circa 1880, when *m* values exceeded 0.2 for the first time, supporting prior expectations of a slow diffusion of marital fertility control. Very roughly, Figs. 1, 2, and 3 indicate that marital fertility decline in southern and western census divisions commenced about three decades after it commenced in the nation's northeastern census divisions. These findings mesh well with Ewbank's analysis of 1910 census data (Ewbank 1991), which found large regional differences in marital fertility persisting into the early twentieth century.

Testing the Ready, Willing, and Able Hypotheses for Married Couples

The 1850–1880 IPUMS samples (Ruggles et al. 2010) also represent a major increase in the quality of data available for analysis of nineteenth century fertility. In this section, I construct empirical models of couples' recent fertility to test hypotheses related to couples' readiness, willingness, and ability to control marital fertility, focusing on identification of possible impediments to the diffusion of marital fertility control.

The IPUMS has four major advantages compared with the available county-level aggregate data. Most obviously, researchers can conduct individual and couple-level analyses, reducing potential bias from spurious ecological correlations. Second, the IPUMS also allows researchers to include variables unavailable in aggregate data sets (e.g., wealth and occupation) to construct tests of additional hypotheses while reducing the potential for omitted variable bias. Third, analysis can be expanded beyond 1860, when the U.S. Census Office ceased publishing age, sex, and race data by county. Finally, and most importantly, the IPUMS allows researchers to restrict analysis to currently married couples. Prior research relying on aggregate state and county child-woman ratios suffered from an inability to distinguish the relative contributions of nuptiality and marital fertility control to observed fertility differences. Although most explanations of the U.S. fertility decline have emphasized the importance of fertility control within marriage, many of the proposed mechanisms may have acted as simple adjustments to nuptiality. The negative correlation between child-woman ratios and farm prices/land availability, for example, has been interpreted as resulting from the conscious and successful practice of birth control among married couples in response to declining agricultural opportunities. Higher farm prices, however, also required young men and women to delay marriage (Guest 1981; Hacker 2008), which may explain part, or all, of the negative correlation between child-woman ratios and farm prices. The difference is critical. The former suggests an innovative behavioral response; the latter, a centuries-old Malthusian check on population growth.

Dependent Variable

A question on the number of own children ever born was first included in the 1900 census. By necessity, mid-nineteenth century fertility studies must rely on the number of own children living in the household at the time of the census. In the following models, I relied on the number of own children younger than 5 years as the dependent variable. It is therefore a measure of reproduction or *net* marital fertility, not gross marital fertility. The choice of children under age 5 was made for practical and theoretical reasons. The variable is available

in the IPUMS and other public use census data sets, such as the North Atlantic Population Project and IPUMS-International databases (Minnesota Population Center 2008, 2014), facilitating its use for comparative studies. By capturing couples' recent net marital fertility, the variable reduces potential temporal biases associating past fertility with variables measured at the time of the census. Choice of all coresident own children as the dependent variable, for example, would have included a greater proportion of couples who lived elsewhere, had higher or lower levels of wealth, and had different occupations when bearing children. Reliance on the number of children under age 5 also reduces potential biases incurred by differences in older children's age of leaving home (Steckel 1996).

To some extent, the variable will reflect differences in child mortality. Although precise data on infant and child mortality differences in the mid-nineteenth century United States are lacking, the available evidence suggests that wealth, educational, and nativity differences were modest or insignificant (Davin 1993; Steckel 1988). Under these conditions, net marital fertility differences and gross marital fertility differences will be approximately equal. (For a recent methodological investigation using Swedish data from the 1900 census, see Scalone and Dribe (forthcoming).) Residence in a large city, however, likely contributed to significantly higher mortality rates relative to rural areas (Preston and Haines 1991; Steckel 1988). To control for this potential bias, dummy variables indicating whether couples resided in a rural area or in a small, moderate, or large urban area were included in the models.

Independent Variables

With a few exceptions (discussed later), I used all suspected correlates of marital fertility in the IPUMS files to construct the most comprehensive models possible. Because of their importance to testing ready, willing, and able hypotheses, I also included a few contextual variables: county-level data on farm prices and churches (Haines and Inter-university Consortium for Political and Social Research 2004) and state-level data on abortion legislation (Lahey 2014a).

Independent variables were sorted into five groups: (1–3) variables associated primarily with couples' readiness, willingness, and ability to control fertility; (4) variables with more ambiguous meaning in the RWA framework; and (5) demographic control variables. Given limitations of the historical data, there is some ambiguity in assigning variables a category. Husbands' occupations, for example, were assumed to capture couples' readiness because of the close association between occupation and income (Jones and Tertilt 2008). Skilled occupations were the first to be affected by returns to education, while most farmers and some industrial workers benefited more from child labor. If occupation also reflected couples' receptiveness to secularization and cultural change, however, occupational differences in fertility may have also reflected differences in couples' willingness. The potential for endogeneity to bias coefficients also suggests caution in interpretation of the results.

Other variables interpreted as primarily capturing aspects of readiness included couples' combined real estate wealth (available in the 1850available in the 1860, and 1870 censuses), couples' combined personal estate wealth (available in 1860 and 1870), average farm prices

in couples' county of residence, and the percentage of children aged 5–17 attending school in the county. The latter was estimated from the individual-level IPUMS data.[2] All wealth and farm values in the 1850 and 1870 samples were converted to 1860 dollars using a consumer price index (Officer and Williamson 2014). Three dummy variables were created for real estate and personal estate wealth (no wealth, moderate wealth, and high wealth) to allow for a possible nonlinear relationship between wealth and fertility.[3] In models including both farm prices and couples' wealth, the variables were interacted to allow for the possibility that couples' sensitivity to farm prices varied by their current level of real wealth.

Inclusion of occupation and wealth satisfies Guinnane's call (Guinnane 2011) for more individual-level analyses of the impact of wealth/income on fertility during the transition. Arguably, the combination of occupation, wealth, and local farm prices also results in the most complete test yet of the land availability/target-bequest hypothesis. According to the theory, we would expect couples with low wealth and couples residing in counties with high farm prices to anticipate the greatest difficulty providing nearby farms for their surviving children, and thus be the most ready to limit their fertility. Couples with high levels of wealth and couples living in counties with low farm prices would presumably find it less difficult to bequeath or purchase a local farm for the same number of children. Moreover, the theory suggests that couples with low levels of wealth are more sensitive to local farm prices than couples with high levels of wealth.

Variables identified as capturing aspects of couples' willingness to control fertility included nativity/ethnicity (Irish, German, British, and other foreign-born); proportion of own children with biblical names; and the proportion of church "seats" in the county held by various church denominations, including those known for their "liberal/pietistic" orientations (Congregational, Society of Friends/Quaker, Unitarian, and Universalist churches), those known for their "conservative/liturgical" orientations (Roman Catholic, Episcopal, and Lutheran), and the fast-growing evangelical churches of the nineteenth century United States (Methodist and Baptist).[4] Because the nativity of wives and husbands were highly correlated (94 % of native-born wives had native-born husbands, and 90 % of foreign-born wives had foreign-born husbands), I treated nativity as a couple-level measure. In the small percentage of cases in which only one partner was native-born, the nativity of the foreign-born partner was used. Many native-born men and women married to foreign-born partners likely shared the same ancestry. Unfortunately, parental birthplace is not available until the 1880 census. In addition, there are too few cases to examine many immigrant groups separately. The analysis considers the three largest groups (Irish, German, and British) separately and groups all other foreign nativities together.

[2]There are two reasons to prefer actual school attendance to the presence of a compulsory attendance law. First, compulsory school attendance laws were relatively rare in the studied period: only Massachusetts and Vermont had compulsory attendance laws prior to 1870. Second, studies of schooling in the nineteenth century United States (Goldin 1999; Landes and Solmon 1972) have concluded that compulsory attendance laws were the consequence of higher school attendance rather than the cause.

[3]High and low values for each category were chosen to create approximately equally sized groups. Couples with $100–$1,500 in real estate were considered to possess moderate real estate wealth, while couples with more than $1,500 in real estate were considered to have high real wealth. Couples with $100–$500 in personal estate wealth were considered to possess moderate personal estate wealth, while couples with more than $500 in personal estate were considered to have high personal wealth. Average farm prices were centered on the mean value for each model.

[4]County-level data on church seating capacities are not available for 1880. I relied instead on the average of the proportion of church seats held by the selected denominations in 1870 and the proportion of church members to all county church members in 1890.

Given the significance of free-thinkers and religious liberals in the early birth control movement and the suspected role of secularization in the onset of the fertility transition, an ideal data set would include direct measures of couples' religion and religiosity. Although no such data exist for the nineteenth century United States, a few indirect measures are available. The U.S. Census Office collected data on America's religious bodies, including each church's seating capacity, and published summary statistics for each county (Finke and Stark 1992; Haines and Inter-university Consortium for Political and Social Research 2004). I included the proportion of all church seats held by the nine largest denominations and the proportion held by all other churches as contextual dummy variables in the regressions. The churches are listed in the tables from the more liberal/pietistic to evangelical to more conservative/liturgical. Because Methodist churches held the largest proportion of church seats in all censuses, the proportion of Methodist church seats was chosen as the omitted reference category in the regressions.

I relied on parents' choice of secular or biblical names for the children as a proxy of religiosity. All else being equal, I assumed that parents choosing a higher proportion of biblical names for their children either (1) held more deeply felt religious beliefs than parents choosing a higher proportion of secular names, or (2) were less open to sources outside of religion for authoritative positions on various topics, including contraception and abortion (Chaves 1994; Moore 1989; Yamane 1997). Although some measurement error is inevitable, the use of children's names represents a rare opportunity to evaluate the impact of parental religiosity on marital fertility during the fertility transition (van Poppel and Derosas 2006). To the extent that the measure imperfectly captures parental religiosity, coefficients will be biased downward (Hacker 1999). In all regression models, couples' nativity was interacted with the proportion of own-child given biblical names and the proportion of county church seats held by each denomination.[5]

Couples' ability to control marital fertility is captured by a variable indicating the presence of a state statute criminalizing abortion. The variable takes on a value of 1 if a law existed in the observation period, and a value of 0 if it did not.[6] Twenty-three states and the District of Columbia passed their first law criminalizing abortion between 1846 and 1864. Four more states passed a law in the period 1866–1869, and five more did so in the period 1875–1879 (Lahey 2014a, 2014b). All census regions had states with and without abortion restrictions at

[5]There are several sources of potential measurement error. Many parents chose names to honor relatives or ancestors and others found religious inspiration in nonbiblical saints' names or in "virtue" names, such as Hope and Grace. Altogether, however, virtue names Grace, Hope, Charity, and Love together made up less than 1 % of all valid girl names. A few popular names may have lost their religious connotations. The results, however, were robust to several tested alternative measures, including estimates constructed after excluding children named after parents or other individuals in the household and after excluding children with the common names John, Thomas, Mary, and Elizabeth. Nonvalid names—mostly initials, illegible names, and titles—were not considered in the calculated proportion. Both the child naming and church seating variables were centered on the model mean values in the regression models.

[6]I relied on Lahey's compilation of abortion statutes (Lahey 2014a) to determine the year a state abortion statute restricting the practice of abortion had been passed. The law was lagged one year to account for the interval between passage of a statute and observed births. An alternative measure, based on whether states had laws explicitly applicable to both the pre- and post-quickening periods, was constructed from information in Quay (1961) and tested in the models. Although the alternative measure typically had the expected positive coefficients, it proved to be statistically insignificant in all models. For the few cases in which a law was passed during the five-year observation interval, the variable was given a value between 0 and 1, representing the proportion of the interval in which the state had a law in place.

the time of the 1850 census, and all regions had states passing their first abortion law in the interval between 1850 and 1880.[7]

In addition to the independent variables associated primarily with readiness, willingness, and ability, the models include demographic control variables (mother's age, age difference from spouse) and a few independent variables identified as relevant by other researchers (literacy and size of place) with ambiguous meaning in the RWA framework. Literacy, for example, which has been shown to be negatively correlated with fertility in diverse studies across time and place, may reflect an orientation toward professional occupations for couples' children (readiness), greater exposure to secular culture (willingness), or greater access to printed birth control information (ability). Because literacy rates were high and highly correlated between wives and husbands, I treated literacy as a couple-level measure. If either the wife or husband was illiterate, I designated the couple illiterate. Similarly, a negative correlation between the population size of couples' place of residence and net marital fertility may reflect the potential access of children to nonfarm opportunities (readiness), better access to communication networks, contraception, and abortion services (ability), residence in an urban cosmopolitan culture more open to the idea of family limitation (willingness), or greater infant and child mortality.

Model Specifications and Universe

Two types of models were constructed. First, ordinary least squares (OLS) regressions were constructed for each census year. The model specification is

$$y_i = \alpha_i + \mathbf{X}_i\beta + \varepsilon_i,$$

where y is the number of own children younger than age 5, and i refers to each currently married woman. The covariates in $\mathbf{X}_i$ include independent variables capturing aspects of couples' readiness, willingness, and ability to control fertility; variables with ambiguous interpretation in the RWA framework; and demographic control variables. Model 1 is limited to couples in the 1850 IPUMS sample; Model 2 to couples in the 1860 IPUMS sample; Model 3, to couples in the 1870 IPUMS sample; and Model 4, to couples in the 1880 IPUMS sample.

Although Models 1–4 are useful for showing cross-sectional relationships between the dependent and independent variables and how those relationships may have changed over the four censuses, the coefficients are likely biased by endogeneity, unobserved heterogeneity, and a few changes in variable availability between census years. To reduce these potential biases, a second set of models was constructed using pooled data from two or more IPUMS samples with state and year fixed effects. The model specification is

[7]Lahey (2014a, 2014b) found no consistent or statistically significant relationship between child-woman ratios, trends in child-woman ratios, various controls, and the passage of a state antiabortion law in the subsequent decade.

$$y_{ijt}=\alpha_i+\mathbf{X}_{ijt}\beta+\gamma_j+\gamma_t+\varepsilon_{ijt},$$

where y is the number of own children younger than age 5; i refers to each currently married woman; j refers to the state of residence; t refers to the census year; and γ_j and γ_t are the state and year fixed effects, respectively. The fixed-effect specifications account for persistent spatial differences and long-term trends in fertility. Regression coefficients reflect the impact of each variable's deviation from state-specific means, controlling for aggregate shocks in the pooled interval.

Because of changes in census questions between 1850 and 1880, the pooled census models tended to include fewer variables than the models for individual census years: for example, real estate wealth is not available in the 1880 census, preventing its use in pooled models containing 1880 census data. Models 5–8 use different combinations of pooled census samples to maximize either the number of independent variables in the model or its temporal coverage. Model 5 includes married couples in all four census samples. Model 6 is limited to couples in the pooled 1850–1870 samples, while Model 7 is limited to couples in the 1860 and 1870 samples. Model 8 relies on the same variables and pooled census years as Model 7, but with the universe restricted to the rural farm population to test hypotheses most relevant to the agricultural population. Among the pooled models, which are more powerful in terms of controlling for unobserved heterogeneity and trends in fertility at the state level, Model 5 contains the fewest variables but benefits from greater temporal coverage. Greater temporal coverage is particularly important in facilitating the observation and analysis of changes in abortion laws on fertility. Models 7 and 8 contain the most variables but suffer from least temporal coverage.

In all models, the universe was restricted to currently married white women aged 20–49.[8] For the fixed-effects models, the universe was further restricted to couples residing in a census region other than the Pacific and Mountain regions, which included too few couples for reliable analysis.

Means for Variables in the Models

Means and standard deviations for variables in the regression models are shown in Table 1. Means are also shown in Table 2 by census division in 1850 and 1880 to give some sense of geographic differences and temporal trends within each division. In 1850, means for the dependent variable ranged from a low of 0.94 children under age 5 per married woman in New England to a high of 1.35 in the East South Central division. Thirty years later, the number of own children younger than 5 had fallen 8.5 % overall, with the largest declines in the Middle Atlantic, East North Central, and West North Central divisions.[9] Significant

[8]Because the regression models required the proportion of parents' children given biblical names, couples in the model have at least one surviving child in the household with a valid name. As a result, the models are restricted to fecund couples and unable to detect the impact of a small percentage of couples who may have remained intentionally childless (Tolnay and Guest 1982). The models benefit, however, from removal of couples who were involuntarily sterile. Other universe restrictions were tested, including restricting the models to couples having at least one surviving child aged 5 years or older and models with no restriction on having surviving children. Models with these universe restrictions yielded similar results.

[9]Survivorship to age 5 increased by approximately 8 % during the same period, while net underenumeration of children under age 5 increased by approximately 7 % (Hacker 2010, 2013).

changes in the independent variables between 1850 and 1880 included a decline in the percentage of men engaged in farming (from 51 % to 44 % over the 30-year interval), a decline in biblically named children (from 47 % to 30 %), an increase in the percentage of couples living in a state with an anti-abortion laws (from 67 % to 90 %), and an increase in the percentage of couples living in urban areas (from 16 % to 27 %). Couples living in New England and the Middle Atlantic census divisions were more likely than couples in other census divisions to live in urban places, were less likely to be engaged in agricultural work, and had the fewest children under age 5. New England couples also lived in counties with a much higher proportion of liberal/pietistic churches and relied more often on secular names for their children.

OLS Regression

The OLS regressions results, shown in Table 3, highlight a large and diverse group of marital fertility correlates. With a few exceptions, results are consistent across cross-sectional and fixed-effects models. Discussion focuses on results for the fixed-effects models (Models 5–8), which are less likely to be biased by unobserved heterogeneity and omitted variable bias.

Readiness

Significant differences in couples' readiness are confirmed by the results of the regression models. Women married to men in professional, managerial, clerical, and sales occupations had approximately 10 % to 18 % fewer children under age 5 than wives of farmers, while women married to craftsmen, apprentices, and laborers had approximately 5 % to 10 % fewer children, supporting expectations that farm couples perceived smaller families as being less advantageous than nonfarm couples. The relationship was found in all cross-sectional and fixed-effects models. Despite declining marital fertility, the coefficients are generally larger in later census years, indicating widening occupational differences in fertility over the period.

All else being equal, couples residing in counties with higher proportions of children attending school had lower net marital fertility than couples in counties with lower school attendance, suggesting that increased school attendance, abetted in some cases by compulsory attendance laws, had an impact on couples' perceived cost of child-bearing. Residence in a county with school attendance 1 standard deviation unit above the mean was associated with approximately 2 % fewer children compared with residence in a county 1 standard deviation unit below the mean.

The impact of average county farm values was inconsistent across models, providing weak support for the land availability/target-bequest hypothesis. Although the sign on the coefficient for Model 5 is in the expected direction, it was not statistically significant. The results for Models 6 and 7, however, which include controls for couples' wealth, indicate a negative relationship between farm prices and marital fertility. Among couples with moderate real estate wealth, residence in a county with an average farm price $2,000 above the mean was associated with approximately 1.5 % fewer children, all else being equal, than residence in a county with farm prices $2,000 below the mean, suggesting that couples adapted to higher farm prices by limiting their fertility. The interaction term for couples with

no real estate wealth and farm prices, however, was positive and statistically significant in both models, indicating that couples with no real estate wealth were less sensitive to local farm prices than couples with moderate wealth. Within a range of typical values, the impact of farm prices on couples with no real estate wealth was negligible. Propertyless couples living in counties with average farm prices $2,000 above the model mean would be expected to have 0.1 % fewer children than couples with no real estate living in counties with farm prices $2,000 below the mean.

The impact of wealth on fertility was mixed. Rather than a positive correlation between real estate wealth and marital fertility, as predicted by the target-bequest hypothesis, the results in Models 6 and 7 indicate an inverted U-shape relationship, with couples at the low and high end of the wealth distribution having fewer children than couples with moderate real estate wealth.[10] The full model results with wealth and farm price interactions indicate that the inverted U-shape relationship between couples' marital fertility and real estate wealth was more pronounced for couples living in counties with low farm prices and less pronounced for couples living in counties with high farm prices.

The best support for the land availability/target-bequest hypothesis is provided by Model 8, whose universe was limited to rural farm couples in the pooled 1860 and 1870 IPUMS samples. The results indicate that farm couples with moderate wealth living in counties with farm prices $2,000 above the mean would be expected to have 6.3 % fewer children under age 5 than couples living in counties with average farm prices $2,000 below the mean (a difference of about 2 standard deviation units)—a much more substantive effect than observed for all couples in Models 6 and 7. High real estate wealth, however, was again associated with lower marital fertility. Rather than being among the least ready to control marital fertility, wealthy farm couples appeared eager to embrace the idea of smaller families and to achieve lower marital fertility rates.

Taken together, the inconsistent impact of farm prices in most models and the observed relationship between wealth and marital fertility are more consistent with the household economics literature on the quantity-quality tradeoff than with the land availability/target-bequest theory. The former predicts a positive relationship between income and fertility at low income levels and a negative relationship after income exceeds a threshold where parents' investments in child quality depresses the number of children demanded (Becker 1981; Wahl 1986, 1992; Winegarden and Wheeler 1992). The land availability/target-bequest hypothesis, however, has some relevance to understanding the demographic behavior of farm couples more attuned to the agricultural economy. In the long run, as research by Jones and Tertilt (2008) makes clear, income/wealth and fertility was negatively correlated. During the early years of the fertility transition, however, the inverted U-shape

[10]The signs on the coefficients for personal estate wealth in Model 7 also suggest an inverted U-shape relationship between wealth and fertility. However, the coefficients were not statistically different from 0 at the .05 level, and the signs on the coefficients are not consistent in Model 8 for the rural farm population. The lack of significance and consistency across models may reflect the lower levels of personal versus real estate wealth—on average, personal estate wealth of couples in Model 7 represented just over one-third of couples' overall wealth—or may reflect disruptions to personal wealth stemming from the abolition of slavery in 1865. Research on child-woman ratios in the 1840 census by Carter et al. (2004) suggested that slave ownership reduced fertility among wealthier southerners. If slave ownership was negatively correlated with marital fertility in 1860, abolition of slavery may have disrupted the relationship between personal estate wealth and fertility in the pooled 1860–1870 model.

relationship between wealth and marital fertility suggests that the relationship was in transition. These results are also consistent with recent research on the French fertility transition (Cummins 2012). While French fertility was high and nondeclining, wealth and fertility were positively correlated. After fertility was declining, the relationship was negative, with wealthier couples on the vanguard of the transition to low fertility.

Willingness

The model results are also consistent with the hypothesis that a lack of willingness was an impediment to the practice of marital fertility control. All else being equal, Irish and German couples had approximately 20 % to 25 % higher net marital fertility rates than native-born white women. British couples had 8 % to 14 % higher fertility rates than native-born white women in the various models, while couples from other foreign countries had 13 % to 14 % higher rates. Previous investigators had conceded that some of the observed differences between native-born and foreign-born women may have been due to socioeconomic differences or place of settlement. Given controls for wealth, occupation, and urban residence, and the use of fixed state effects in the model, however, the large fertility differences by nativity suggest large differences in couples' willingness to practice marital fertility control.

Traditional religious beliefs, as proxied by church seating capacities of evangelical churches relative to liberal/pietistic churches and couples' reliance on biblical names for their children, also appear to have been a significant obstacle to the practice of birth control. The coefficient for children's biblical names was positive and statistically significant. All else being equal, couples choosing biblical names for their children had approximately 5 % more children than parents choosing secular names. Because the child-naming variable is believed to be an imperfect proxy of parental religiosity, the true impact of parental religiosity was likely larger.

The impact of religion also received mixed support from correlations observed between church seating capacities and couples' marital fertility. Although we cannot be sure of their attendance or membership in any given church, couples living in counties with higher proportions of church seats held by Congregational and Universalist churches—churches noted for their liberal/pietistic orientations—had significantly lower marital fertility rates relative to the couples living in counties dominated by the evangelical Methodist church. Most coefficients for Unitarian and Society of Friends (Quaker) church seats—two other denominations noted for their liberal/pietistic orientations and greater opportunities for women—were in the expected negative direction but were not significantly different from the reference group. The marital fertility of couples living in counties with greater proportional seating capacities of Lutheran and Roman Catholic church seats—churches characterized by more conservative/liturgical practices—was not statistically different from the reference group of Methodist church seats, while couples living in counties with greater proportions of church seats held by Episcopal churches had lower net marital fertility rates. The choice of Methodists as the reference group, of course, affects the size and statistical significance of the coefficients. Although the Methodist church in the nineteenth century was not characterized by liturgical practices or a hierarchical organization, it was a rapidly

growing evangelical church with relatively poor and fervent church members. The Episcopalian laity, in contrast, enjoyed a relatively high socioeconomic position. In 1850, the average value of Episcopalian church property ($7,919) was second only to that of Unitarians ($13,449) and more than six times that of Methodists ($1,174) (Finke and Stark 1992).

Ability

Model 5 includes the greatest temporal coverage and the largest number of observations of changes in abortion laws. Arguably, it results in the best estimate of the impact of anti-abortion legislation on couples' ability to control marital fertility. The results indicate that residence in a state with an anti-abortion law was associated with 6 % higher net fertility, suggesting that legal restrictions prevented some couples—or perhaps women without their husbands' knowledge—from limiting their fertility via induced abortion. This result was lower than expected from the social history literature on abortion (e.g., Mohr 1978) but within the range reported by Lahey (2014a, 2014b), whose analysis of state child-woman ratios in the 1850–1910 censuses suggested that abortion laws were associated with 4 % to 15 % higher child-woman ratios. It nevertheless indicates that couples' ability to control fertility varied by state. Note that Lahey's results apply to all women, not just married women. Single women had greater incentives to abort an unwanted pregnancy and were likely affected more than married women from the introduction of state anti-abortion laws. When abortion was legalized in the late twentieth century United States, single women were more likely to take advantage of the opportunity to procure a legal abortion. Levine et al. (1999) found that nonmarital births fell by almost twice the rate of marital births in states repealing abortion laws between 1971 and 1973.

Additional Variables

Unsurprisingly, literacy and size of place proved to be significant correlates of marital fertility. Couples designated as literate (both partners able to read and write) achieved 7 % to 10 % lower marital fertility rates than illiterate couples, consistent with both the expectation that literacy increased couples' access to and knowledge of birth control methods and the hypotheses related to readiness and willingness. Residence in an urban area was associated with 6 % to 9 % fewer own children younger than age 5, consistent with the hypothesis that urban residence facilitated couples' access to information, contraceptive goods, and abortion services. These results were likely driven by higher infant and childhood mortality rates in urban areas, however. In 1900, residence in a city of 5,000 or more individuals was associated with 20 % to 36 % higher infant and child mortality rates relative to the reference group of cities with 1,000–4,999 inhabitants (Preston and Haines 1991). Although environmental conditions in cities were deteriorating in the late nineteenth century, differences were likely large enough in the period 1850–1880 to account for most, if not all, of the net fertility differences observed.

Discussion

The results of this study indicate large regional differences in the timing and pace of marital fertility decline and the presence of significant economic, cultural, and legal bottlenecks to

the adoption of marital fertility control. New own-child fertility estimates indicate that the onset of marital fertility in the nation's southern and western census divisions lagged the onset of the decline in northeastern census divisions by about three decades. Empirical models, while providing only modest support for the dominant land availability/target-bequest hypothesis, show significant differences in couples' readiness to limit family size. Women married to farmers had significantly more children than women married to men in other occupations, suggesting that farm couples were less likely to perceive an economic advantage to smaller families. Women married to men in professional, managerial, and sales occupations achieved the lowest fertility rates. Couples in areas with higher levels of school attendance also had fewer children than couples in areas with low school attendance, suggesting higher net costs of childbearing associated with children's changing roles. Finally, wealth differences in marital fertility indicate the existence of quality-quantity tradeoffs in the early stages of the U.S. fertility transition. There was an inverted U-shape relationship between real estate wealth and fertility, with couples in the middle of the wealth distribution having the most children.

New ideas about the acceptability of birth control were needed before couples could act on economic incentives for fewer children. Although no direct assessment of couples' willingness was available, nativity and indirect measures of religion and religiosity proved to be significantly correlated with marital fertility rates. All else being equal, Irish, German, British, and other foreign-born couples appeared less willing to practice marital fertility control than native-born white couples. Parents who chose a higher proportion of biblical names for their children had higher fertility rates than parents who relied on secular names, suggesting a positive relationship between parental religiosity and marital fertility. The long-term decline in the use of biblical names suggests that secularization was a necessary precondition of willingness and the practice of birth control.

Analysis of county-level church seating capacities indicated that greater proportional representation of several church denominations noted for their "liberal/pietistic" orientation was associated with lower marital fertility, providing further support for the hypothesis that secularization reduced cultural impediments to the practice of marital fertility control. The fact that early advocates of birth control in antebellum America were religious liberals or freethinkers further supports this conclusion.

Support was also found for the importance of differences in couples' ability to control fertility. The passage of state statutes criminalizing abortion in the mid-nineteenth century was positively associated with couples' marital fertility. All else being equal, residence in a state with an anti-abortion law was correlated with fertility rates that were 6 % higher among couples in the pooled 1850–1880 model. Although the result is more modest than that suggested by the social history literature on abortion (e.g., Mohr 1978), it suggests that nineteenth century efforts to curtail the practice of induced abortion were effective. Women in states with an anti-abortion law were less able to limit their reproduction.

Relative to differences observed later in the fertility transition, the substantive impact of readiness and willingness variables was small. For example, the 10 % to 15 % higher marital fertility rates among women married to farmers relative to women married to men with

professional, managerial, and sales occupations were approximately one-half of those observed in a recent analysis of the 1900 IPUMS sample (Dribe et al. 2014a). The observed 8 % to 22 % higher marital fertility rates among Irish-, German-, and British-born couples relative to native-born couples were also about one-half of the differences observed in an analysis of the 1910 census (Morgan et al. 1994). Marital fertility decline was in its initial phase, however, and remained largely confined to northern census divisions until late in the century (Ewbank 1991). It is therefore not surprising that marital fertility differences near the onset of the fertility transition were small relative to differences in the middle of the transition.

Cross-sectional information in the census is best suited for estimation of fertility differences, not for inferences about fertility change. Nonetheless, the signs on most coefficients were mostly consistent with expectations and fertility trends. Where information is known, long-term trends in independent variables preceded or paralleled the decline in marital fertility. The percentage of the labor force engaged in agriculture declined from 74 % to 48 % between 1800 and 1880; the percentage of the population living in urban areas increased from 6 % to 28 %; and the percentage of native-born children of native-born parents given biblical names fell from 51 % to 27 % overall and from 57 % to 18 % in New England, which was the census division with the earliest decline in marital fertility (Carter 2006; Hacker 1999). Although reliable data on school attendance and literacy prior to 1870 are lacking, historians agree that the first major transformation in American education—the expansion of primary education to provide most children schooling through eighth grade—occurred in the nineteenth century and was accompanied by marked increases in literacy, especially among females (Goldin 1999).

A few long-term trends in the identified covariates were inconsistent with the onset of marital fertility decline. The model results suggest that the criminalization of abortion and increasing proportions of foreign-born men and women in the mid-nineteenth century acted as deterrents to faster marital fertility decline, not as a catalyst to its onset. The percentage of church members belonging to liberal/pietistic Protestant denominations fell over the course of the century (Finke and Stark 1992), but the decline was itself a function of lower fertility among liberal church members. The loss of religious vitality among liberal/pietistic churches relative to that of expanding evangelical churches could have played a role in the onset of the fertility transition, even if their declining share of the religious marketplace suggests its declining relevance over time.

Model results were also largely consistent with regional differences in fertility. Census divisions with higher proportions of men engaged in farming, couples living in rural areas, children given biblical names, children not attending schools, and Baptist and Methodist church seats tended to have the highest marital fertility rates; regions with higher proportions of men in professional/managerial/clerical occupations, couples living in large urban areas, children attending schools, and church seats held by liberal/pietistic churches tended to have the lowest marital fertility rates. These patterns suggest that regional differences in couples' readiness and willingness to control fertility played a role in regional differences in marital fertility rates and the timing of marital fertility decline. The regional distribution of anti-

abortion statutes and the foreign-born populations, however, were inconsistent with regional patterns of marital fertility.

Overall, the RWA framework proved useful. The significant statistical and substantive results of all three components demonstrate the need for more inclusive models of fertility decline. Too often, research on U.S. fertility decline has focused exclusively on economic factors. Although couples' increasing readiness to practice marital fertility control was a necessary precondition to the fertility transition, lack of willingness and lack of ability played important roles in the slow onset of the fertility transition in the United States. The results suggest that failure to include measures of willingness and ability in empirical models of fertility will result in an incomplete understanding of the transition to controlled reproduction.

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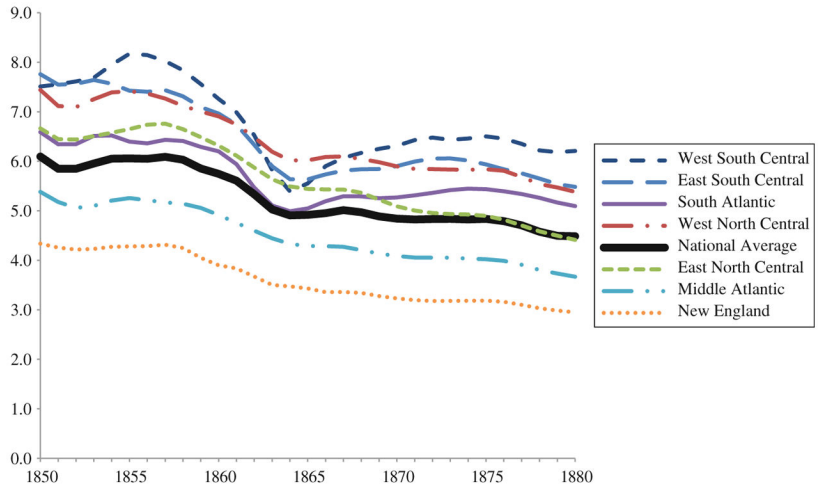

Fig. 1.

Total fertility rate by census division, 1850–1880. *Source:* 1850–1880 IPUMS samples (Ruggles et al. 2010)

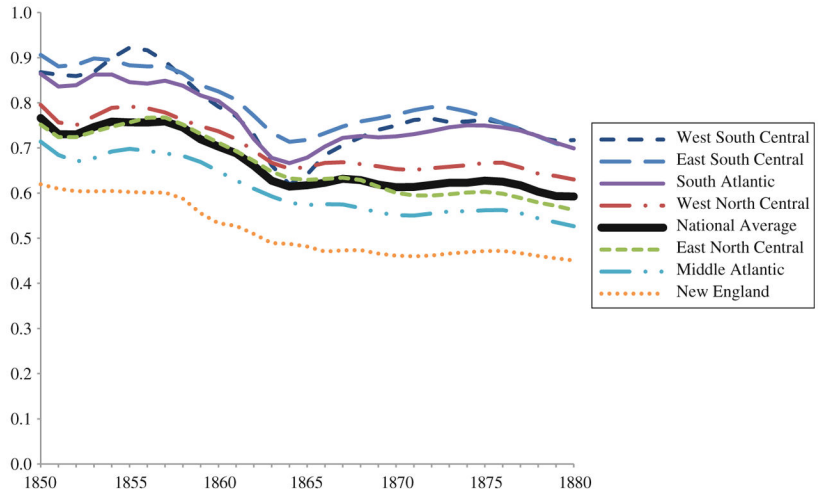

Fig. 2.

Index of marital fertility, $I(g)$, by census division, 1850–1880. *Source:* 1850–1880 IPUMS samples (Ruggles et al. 2010)

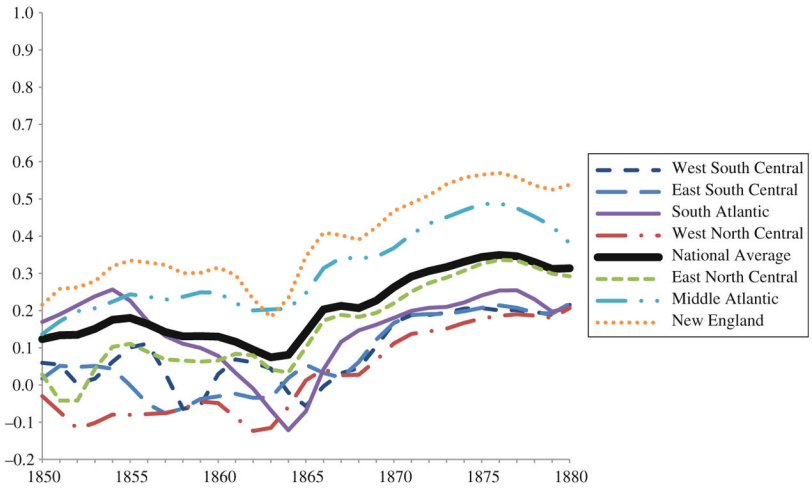

Fig. 3.

Coale and Trussell *m* parameter by census division, 1850–1880. Source: 1850–1880 IPUMS samples (Ruggles et al. 2010)

Table 1

Means of variables in regression models

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
Census Year	1850		1860		1870		1880		1850–1880		1850–1870		1860–1870		1860–1870	
Fixed State and Year Effects	No		No		No		No		Yes		Yes		Yes		Yes	
Additional Universe Restriction															Rural Farm	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Number of Own Children Younger Than 5	1.17	0.88	1.18	0.90	1.08	0.89	1.07	0.91	1.11	0.90	1.14	0.89	1.12	0.90	1.16	0.92
Covariates Associated With “Readiness”																
Father’s occupational group																
Professional, technical	0.03	0.17	0.03	0.17	0.03	0.17	0.03	0.18	0.03	0.17	0.03	0.17	0.03	0.17	—[a]	—[a]
Farmers and farm operatives	0.51	0.50	0.45	0.50	0.43	0.49	0.43	0.50	0.45	0.50	0.46	0.50	0.44	0.50	1.00	0.00
Managers, official, proprietors	0.06	0.23	0.06	0.24	0.07	0.26	0.08	0.26	0.07	0.25	0.06	0.25	0.07	0.25	—[a]	—[a]
Clerical and sales	0.01	0.11	0.02	0.13	0.03	0.16	0.04	0.19	0.03	0.16	0.02	0.14	0.02	0.15	—[a]	—[a]
Craftsmen	0.18	0.39	0.18	0.39	0.16	0.37	0.15	0.36	0.16	0.37	0.17	0.38	0.17	0.38	—[a]	—[a]
Apprentices, operatives	0.07	0.25	0.08	0.27	0.10	0.30	0.11	0.31	0.09	0.29	0.08	0.28	0.09	0.29	—[a]	—[a]
Service workers	0.00	0.07	0.01	0.08	0.01	0.10	0.01	0.11	0.01	0.09	0.01	0.09	0.01	0.09	—[a]	—[a]
Farm laborers	0.00	0.04	0.04	0.18	0.06	0.24	0.03	0.18	0.04	0.19	0.04	0.19	0.05	0.22	—[a]	—[a]
Laborers	0.11	0.31	0.11	0.31	0.10	0.30	0.10	0.30	0.10	0.31	0.10	0.31	0.10	0.31	—[a]	—[a]
No occupational response	0.03	0.18	0.03	0.16	0.01	0.11	0.02	0.12	0.02	0.14	0.02	0.15	0.02	0.14	—[a]	—[a]
Real estate wealth ($1,000)	1.29	5.56	1.81	7.54	1.43	4.80	—[a]	—[a]	—[a]	—[a]	1.53	6.01	1.60	6.14	2.06	5.31
None	0.46	0.50	0.44	0.50	0.45	0.50	—[a]	—[a]	—[a]	—[a]	0.45	0.50	0.44	0.50	0.24	0.43
Moderate wealth	0.34	0.47	0.31	0.46	0.32	0.47	—[a]	—[a]	—[a]	—[a]	0.32	0.47	0.31	0.46	0.39	0.49
High wealth	0.21	0.40	0.26	0.44	0.23	0.42	—[a]	—[a]	—[a]	—[a]	0.23	0.42	0.24	0.43	0.36	0.48
Personal estate wealth ($1,000)			1.23	6.27	0.63	3.42	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0.89	4.87	1.01	4.17
None	—[a]	—[a]	0.26	0.44	0.37	0.48	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0.32	0.47	0.14	0.35
Moderate wealth	—[a]	—[a]	0.45	0.50	0.38	0.49	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0.41	0.49	0.48	0.50
High wealth	—[a]	—[a]	0.29	0.45	0.25	0.43	—[a]	—[a]	—[a]	—[a]	—[a]	—[a]	0.27	0.44	0.38	0.48

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
Census Year	**1850**		**1860**		**1870**		**1880**		**1850–1880**		**1850–1870**		**1860–1870**		**1860–1870**	
Fixed State and Year Effects	**No**		**No**		**No**		**No**		**Yes**		**Yes**		**Yes**		**Yes**	
Additional Universe Restriction															**Rural Farm**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Average value of farms in county ($10,000)	0.37	0.50	0.67	1.39	0.40	0.51	0.38	0.53	0.45	0.80	0.49	0.92	0.52	1.01	0.27	0.20
Proportion of children aged 8–14 in school	0.59	0.20	0.62	0.18	0.57	0.22	0.56	0.16	0.58	0.19	0.59	0.20	0.60	0.20	0.57	0.23
Covariates Associated With “Willingness”																
Proportion of children biblically named	0.47	0.33	0.42	0.34	0.36	0.34	0.30	0.32	0.37	0.34	0.41	0.34	0.39	0.34	0.40	0.33
Religious composition of county (church seats)																
Proportion Universalist	0.02	0.03	0.01	0.03	0.00	0.02	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.02
Proportion Unitarian	0.01	0.04	0.01	0.03	0.01	0.03	0.01	0.02	0.01	0.03	0.01	0.03	0.01	0.03	0.00	0.01
Proportion Congregationalist	0.06	0.12	0.06	0.11	0.05	0.10	0.05	0.09	0.06	0.10	0.06	0.11	0.06	0.10	0.04	0.09
Proportion Society of Friends	0.02	0.05	0.01	0.04	0.00	0.03	0.01	0.02	0.01	0.03	0.01	0.04	0.01	0.03	0.01	0.04
Proportion Presbyterian	0.15	0.13	0.11	0.09	0.13	0.11	0.10	0.08	0.12	0.10	0.13	0.11	0.12	0.10	0.12	0.11
Proportion other	0.11	0.16	0.14	0.15	0.15	0.14	0.17	0.15	0.15	0.15	0.13	0.15	0.14	0.14	0.14	0.16
Proportion Baptist	0.20	0.17	0.17	0.15	0.17	0.14	0.18	0.15	0.18	0.15	0.18	0.15	0.17	0.15	0.21	0.17
Proportion Methodist	0.29	0.16	0.31	0.15	0.28	0.15	0.28	0.13	0.29	0.14	0.29	0.15	0.30	0.15	0.33	0.16
Proportion Episcopalian	0.04	0.06	0.05	0.06	0.04	0.06	0.04	0.05	0.04	0.06	0.05	0.06	0.05	0.06	0.03	0.05
Proportion Lutheran	0.04	0.08	0.04	0.07	0.05	0.07	0.05	0.07	0.05	0.07	0.04	0.08	0.04	0.07	0.04	0.07
Proportion Roman Catholic	0.06	0.11	0.09	0.12	0.11	0.13	0.11	0.11	0.10	0.11	0.09	0.11	0.10	0.12	0.07	0.11
Nativity																
Native-born	0.82	0.39	0.71	0.45	0.67	0.47	0.69	0.46	0.71	0.45	0.72	0.45	0.69	0.46	0.83	0.37
Irish	0.07	0.26	0.11	0.31	0.11	0.31	0.09	0.28	0.09	0.29	0.10	0.30	0.11	0.31	0.04	0.19
German	0.05	0.22	0.09	0.29	0.11	0.31	0.10	0.31	0.10	0.30	0.09	0.29	0.10	0.31	0.06	0.24
British	0.04	0.19	0.05	0.21	0.05	0.21	0.04	0.20	0.04	0.20	0.04	0.21	0.05	0.21	0.03	0.16
Other foreign-born	0.02	0.15	0.04	0.19	0.06	0.24	0.08	0.27	0.06	0.23	0.04	0.21	0.05	0.22	0.04	0.19
Covariates Associated With “Ability”																
Residence in state with anti-abortion law	0.66	0.42	0.86	0.34	0.88	0.32	0.90	0.29	0.85	0.34	0.82	0.36	0.87	0.33	0.83	0.37
Other Covariates																
Literacy	0.84	0.37	0.87	0.34	0.83	0.38	0.86	0.35	0.85	0.36	0.84	0.36	0.84	0.36	0.83	0.38
Residence type																

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
Census Year	**1850**		**1860**		**1870**		**1880**		**1850–1880**		**1850–1870**		**1860–1870**		**1860–1870**	
Fixed State and Year Effects	**No**		**No**		**No**		**No**		**Yes**		**Yes**		**Yes**		**Yes**	
Additional Universe Restriction															**Rural Farm**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Rural	0.84	1.64	0.79	1.59	0.75	1.57	0.72	1.55	0.76	0.43	0.78	1.59	0.77	1.58	1.00	0.00
Urban less than 10,000	0.03	0.17	0.05	0.21	0.05	0.22	0.06	0.24	0.05	0.22	0.05	0.21	0.05	0.22	__ [a]	__ [a]
Urban 10,000–100,000	0.07	0.26	0.07	0.26	0.09	0.29	0.09	0.28	0.08	0.28	0.08	0.27	0.08	0.28	__ [a]	__ [a]
Urban, 100,000+	0.05	0.23	0.09	0.29	0.11	0.31	0.13	0.33	0.10	0.30	0.09	0.29	0.10	0.30	__ [a]	__ [a]
Demographic Control Variables																
Mother's age																
20–24	0.15	0.36	0.16	0.37	0.14	0.35	0.14	0.35	0.15	0.36	0.15	0.36	0.15	0.36	0.14	0.35
25–29	0.22	0.41	0.22	0.41	0.21	0.40	0.21	0.40	0.21	0.41	0.21	0.41	0.21	0.41	0.20	0.40
30–34	0.21	0.40	0.21	0.41	0.20	0.40	0.20	0.40	0.20	0.40	0.20	0.40	0.20	0.40	0.19	0.39
35–39	0.17	0.38	0.17	0.38	0.19	0.39	0.19	0.39	0.18	0.39	0.18	0.38	0.18	0.38	0.18	0.38
40–44	0.14	0.35	0.14	0.34	0.15	0.36	0.15	0.36	0.15	0.35	0.14	0.35	0.15	0.35	0.16	0.37
45–49	0.10	0.31	0.10	0.30	0.12	0.32	0.12	0.32	0.11	0.31	0.11	0.31	0.11	0.31	0.13	0.34
Age difference from spouse	4.67	5.62	4.80	5.68	5.19	5.82	5.16	6.11	4.98	5.86	4.92	5.72	5.00	5.76	5.34	5.89
Number of Observations	20,414		29,708		37,570		48,281		133,493		86,520		66,183		28,840	

Notes: Universe for Models 1–4 includes all currently married white women aged 20–49 with spouse present and one or more own child with a valid first name. Models 5–8 include all currently married white women aged 20–49 with spouse present, living in a census region other than the Pacific and Mountain regions, and having at least one own child with a valid first name.

Source: Ruggles et al. (2010).

[a]Variable not available in census year.

Table 2

Means of variables in regression models, by region in 1850 and 1880

	Region													
	New England		Middle Atlantic		East North Central		West North Central		South Atlantic		East South Central		West South Central	
	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880
Number of Own Children Younger Than 5	0.94	0.87	1.11	0.96	1.23	1.03	1.29	1.14	1.27	1.25	1.35	1.23	1.19	1.28
Covariates Associated With “Readiness”														
Mother’s labor force participation	__ *a*	0.02	__ *a*	0.02	__ *a*	0.01	__ *a*	0.01	__ *a*	0.02	__ *a*	0.01	__ *a*	0.01
Father’s occupational group														
Professional, technical	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Farmers and farm operatives	0.34	0.19	0.35	0.20	0.63	0.47	0.67	0.63	0.57	0.55	0.71	0.66	0.61	0.67
Managers, official, proprietors	0.08	0.09	0.07	0.10	0.04	0.08	0.05	0.06	0.05	0.06	0.03	0.04	0.05	0.05
Clerical and sales	0.02	0.04	0.02	0.05	0.01	0.04	0.00	0.03	0.01	0.03	0.01	0.02	0.02	0.03
Craftsmen	0.24	0.20	0.24	0.21	0.15	0.15	0.12	0.10	0.16	0.12	0.11	0.08	0.13	0.07
Apprentices, operatives	0.12	0.27	0.09	0.18	0.04	0.09	0.04	0.05	0.05	0.05	0.02	0.04	0.03	0.02
Service workers	0.00	0.01	0.01	0.02	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.01
Farm laborers	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.02	0.00	0.06	0.00	0.05	0.00	0.04
Laborers	0.14	0.12	0.16	0.16	0.07	0.10	0.05	0.06	0.09	0.08	0.05	0.05	0.07	0.06
No occupational response	0.03	0.02	0.04	0.02	0.03	0.01	0.03	0.01	0.04	0.02	0.03	0.02	0.04	0.02
Real estate wealth ($1,000)	1.13	__ *a*	1.56	__ *a*	1.11	__ *a*	0.72	__ *a*	1.30	__ *a*	1.21	__ *a*	2.06	__ *a*
None	0.48	__ *a*	0.53	__ *a*	0.36	__ *a*	0.43	__ *a*	0.50	__ *a*	0.41	__ *a*	0.50	__ *a*
Low to moderate wealth	0.31	__ *a*	0.23	__ *a*	0.42	__ *a*	0.44	__ *a*	0.32	__ *a*	0.43	__ *a*	0.33	__ *a*
High wealth	0.22	__ *a*	0.24	__ *a*	0.21	__ *a*	0.13	__ *a*	0.18	__ *a*	0.16	__ *a*	0.17	__ *a*
Average value of farms in county ($10,000)	0.31	0.44	0.66	0.62	0.21	0.33	0.16	0.21	0.31	0.47	0.19	0.12	0.44	0.10
Proportion of children aged 8–14 in school	0.79	0.69	0.66	0.61	0.62	0.63	0.44	0.61	0.37	0.38	0.43	0.38	0.38	0.32
Covariates Associated With “Willingness”														
Proportion of children biblically named	0.39	0.26	0.45	0.31	0.48	0.26	0.49	0.27	0.50	0.35	0.52	0.36	0.46	0.32
Religious composition of county (church seats)														
Proportion Universalist	0.06	0.04	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Proportion Unitarian	0.07	0.05	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Region													
	New England		Middle Atlantic		East North Central		West North Central		South Atlantic		East South Central		West South Central	
	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880
Proportion Congregationalist	0.31	0.27	0.03	0.03	0.04	0.04	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.01
Proportion Society of Friends	0.02	0.00	0.03	0.01	0.02	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Proportion Presbyterian	0.01	0.01	0.21	0.16	0.17	0.10	0.14	0.10	0.10	0.05	0.16	0.10	0.11	0.08
Proportion other	0.07	0.06	0.12	0.18	0.11	0.22	0.20	0.25	0.07	0.12	0.07	0.12	0.23	0.13
Proportion Baptist	0.21	0.19	0.14	0.11	0.15	0.12	0.24	0.15	0.30	0.34	0.39	0.38	0.16	0.33
Proportion Methodist	0.16	0.17	0.25	0.23	0.35	0.29	0.24	0.26	0.39	0.39	0.34	0.34	0.30	0.32
Proportion Episcopalian	0.05	0.07	0.06	0.08	0.03	0.02	0.02	0.02	0.06	0.04	0.01	0.02	0.02	0.03
Proportion Lutheran	0.00	0.00	0.07	0.07	0.04	0.08	0.03	0.06	0.03	0.02	0.00	0.00	0.00	0.02
Proportion Roman Catholic	0.04	0.14	0.07	0.13	0.08	0.12	0.11	0.11	0.03	0.03	0.02	0.03	0.18	0.09
Nativity														
Native-born	0.83	0.62	0.73	0.59	0.80	0.62	0.82	0.65	0.93	0.92	0.96	0.93	0.78	0.84
Irish	0.10	0.18	0.13	0.16	0.05	0.06	0.03	0.05	0.02	0.02	0.01	0.02	0.06	0.02
German	0.00	0.03	0.06	0.13	0.08	0.16	0.11	0.12	0.03	0.03	0.01	0.03	0.07	0.05
British	0.03	0.05	0.06	0.06	0.05	0.05	0.03	0.04	0.01	0.01	0.01	0.01	0.01	0.02
Other foreign-born	0.03	0.12	0.02	0.06	0.03	0.11	0.01	0.13	0.01	0.01	0.00	0.01	0.08	0.07
Covariates Associated With “Ability”														
Residence in state with anti-abortion law	0.81	1.00	0.76	1.00	0.89	1.00	0.99	1.00	0.09	0.62	0.32	0.32	0.32	1.00
Other Covariates														
Literacy	0.95	0.89	0.91	0.89	0.84	0.90	0.78	0.90	0.73	0.74	0.69	0.72	0.70	0.79
Residence type														
Rural	0.78	0.64	0.75	0.52	0.92	0.74	0.91	0.84	0.87	0.86	0.95	0.92	0.85	0.88
Urban less than 10,000	0.05	0.03	0.03	0.08	0.03	0.09	0.01	0.05	0.03	0.03	0.02	0.02	0.01	0.03
Urban 10,000–100,000	0.13	0.23	0.12	0.11	0.03	0.07	0.08	0.06	0.03	0.06	0.03	0.03	0.02	0.03
Urban, 100,000+	0.05	0.11	0.10	0.29	0.02	0.10	0.00	0.05	0.07	0.06	0.00	0.03	0.11	0.06
Demographic Control Variables														
Mother’s age														
20–24	0.10	0.10	0.14	0.12	0.17	0.13	0.18	0.16	0.17	0.17	0.20	0.18	0.19	0.21
25–29	0.20	0.17	0.22	0.20	0.23	0.21	0.23	0.21	0.22	0.21	0.21	0.22	0.24	0.24
30–34	0.21	0.20	0.21	0.20	0.20	0.20	0.22	0.20	0.19	0.20	0.20	0.18	0.20	0.19

	Region													
	New England		Middle Atlantic		East North Central		West North Central		South Atlantic		East South Central		West South Central	
	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880	1850	1880
35–39	0.18	0.21	0.17	0.20	0.18	0.19	0.16	0.18	0.18	0.18	0.16	0.18	0.16	0.16
40–44	0.17	0.18	0.14	0.16	0.13	0.15	0.13	0.14	0.13	0.14	0.13	0.13	0.14	0.12
45–49	0.14	0.14	0.11	0.13	0.09	0.12	0.08	0.11	0.10	0.10	0.09	0.11	0.07	0.09
Age difference from spouse	3.89	4.39	4.31	4.66	4.83	5.25	5.28	5.59	5.04	5.06	5.29	5.37	5.53	6.00

Note: Universe includes all currently married white women aged 20–49 with spouse present, living in a census region other than the Pacific and Mountain regions, and having at least one own child with a valid first name.

Source: Ruggles et al. (2010).

[a]Variable not available in census year.

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Table 3

OLS regression of recent net marital fertility

	Model							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Census Years	**1850**	**1860**	**1870**	**1880**	**1850–1880**	**1850–1870**	**1860–1870**	**1860–1870**
Fixed State and Year Effects	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Additional Universe Restriction								**Rural Farm**
Covariates Associated With "Readiness"								
Father's occupational group								
Professional, technical	−0.145***	−0.115***	−0.107***	−0.191***	−0.148***	−0.121***	−0.112***	—
Farmers and farm operatives	ref.	ref.	ref.	ref.	ref.	ref.	ref.	—
Managers, official, proprietors	−0.120***	−0.122***	−0.158***	−0.154***	−0.150***	−0.142***	−0.144***	—
Clerical and sales	−0.127*	−0.176***	−0.134***	−0.193***	−0.167***	−0.146***	−0.144***	
Craftsmen	−0.090***	−0.073***	−0.076***	−0.112***	−0.087***	−0.077***	−0.073***	—
Apprentices, operatives	−0.094***	−0.092***	−0.095***	−0.082***	−0.080***	−0.088***	−0 .088***	—
Service workers	−0.093	−0.126*	−0.075†	−0.193***	−0.129***	−0.085**	−0.086*	—
Farm laborers	−0.212†	−0.002	−0.069***	−0.071**	−0.055***	−0.043**	−0.039*	—
Laborers	−0.051*	−0.037*	−0.090***	−0.070***	−0.064***	−0.058***	−0.062***	—
No occupational response	−0.127***	−0.132***	−0.199***	−0.159***	−0.160***	−0.152***	−0.160***	—
Real estate wealth								
None	−0.007	−0.060***	−0.004	—	—	−0.030***	−0.034***	−0.047***
Moderate wealth	ref.	ref.	ref.	—	—	ref.	ref.	ref.
High wealth	−0.026	−0.061***	−0.028*	—	—	−0.046***	−0.045***	−0.058***
Personal estate wealth								
None	—	−0.016	−0.017†	—	—	—	−0.008	−0.007
Moderate wealth	—	ref.	ref.	—	—	—	ref.	ref.
High wealth	—	0.011	−0.038**	—	—	—	−0.013	0.007
Average value of farms in county ($10,000)	−0.085†	−0.036	−0.124**	−0.013	−0.009	−0.041*	−0.043*	−0.183**
Wealth and farm price interactions								

	Model							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Census Years	**1850**	**1860**	**1870**	**1880**	**1850–1880**	**1850–1870**	**1860–1870**	**1860–1870**
Fixed State and Year Effects	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Additional Universe Restriction								**Rural Farm**
No real estate wealth × Average farm price	0.102*	0.026	0.081*	—	—	0.042*	0.039*	0.131†
High real estate wealth × Average farm price	0.108†	0.014	0.099*	—	—	0.031	0.032	0.067
No personal estate wealth × Average farm price	—		0.014	—	—	—	0.004	0.077
High personal estate wealth × Average farm price	—	−0.002	−0.035	—	—	—	−0.002	0.081
Proportion of children aged 8–14 in school	−0.143***	−0.093**	−0.174***	−0.214***	−0.066***	−0.051*	−0.050*	−0.068*
Covariates Associated With “Willingness”								
Proportion of children biblically named	0.049*	0.043**	0.058***	0.085***	0.059***	0.044***	0.040***	0.022
Religious composition of county (church seats)								
Proportion Universalist	−0.922**	−1.268***	−1.125**	−1.471***	−0.831***	−0.670***	−0.829**	−0.647†
Proportion Unitarian	−0.074	−0.316	0.113	0.411	−0.079	−0.098	−0.134	0.322
Proportion Congregationalist	−0.474***	−0.575***	−0.312***	−0.563***	−0.397***	−0.353***	−0.349***	−0.299**
Proportion Society of Friends	−0.091	−0.297*	0.083	−0.575**	−0.047	0.013	−0.062	−0.091
Proportion Presbyterian	−0.105†	−0.236**	0.057	−0.268***	−0.040	−0.029	−0.033	0.056
Proportion other	−0.091†	−0.104*	−0.035	0.016	−0.064**	−0.080**	−0.082*	−0.075†
Proportion Baptist	−0.131*	−0.037	−0.075	0.147**	−0.033	−0.089**	−0.065†	−0.058
Proportion Methodist	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Proportion Episcopalian	−0.713***	−0.728***	−0.465***	−0.150	−0.386***	−0.468***	−0.457***	−0.471***
Proportion Lutheran	0.036	0.131	0.197*	0.110	0.086†	0.066	0.090	0.178†
Proportion Roman Catholic	−0.181**	−0.160*	−0.142**	−0.076	−0.056	−0.075†	−0.089†	−0.109
Nativity								
Native-born	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Irish	0.014	0.248***	0.301***	0.191***	0.240***	0.238***	0.282***	0.279***
German	0.167***	0.248***	0.240***	0.249***	0.243***	0.230***	0.256***	0.233***
British	−0.035	0.118**	0.114**	0.043	0.083***	0.098***	0.129***	0.159**

	Model							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Census Years	**1850**	**1860**	**1870**	**1880**	**1850–1880**	**1850–1870**	**1860–1870**	**1860–1870**
Fixed State and Year Effects	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Additional Universe Restriction								**Rural Farm**
Other foreign-born	0.134 *	0.098 *	0.179 ***	0.162 ***	0.160 ***	0.147 ***	0.144 ***	0.142 **
Covariates Associated With “Ability”								
Residence in state with anti-abortion law	−0.024	−0.012	−0.035 *	−0.014	0.071 ***	0.044 *	0.107 †	−0.040
Other Covariates								
Literacy	−0.062 ***	−0.087 ***	−0.084 ***	−0.083 ***	−0.083 ***	−0.077 ***	−0.081 ***	−0.105 ***
Residence Type								
Rural	ref.	ref.	ref.	ref.	ref.	ref.	ref.	—
Urban less than 10,000	−0.041	−0.049 *	−0.074 ***	−0.065 ***	−0.070 ***	−0.067 ***	−0.069 ***	—
Urban 10,000–100,000	−0.081 **	−0.071 ***	−0.096 ***	−0.073 ***	−0.087 ***	−0.092 ***	−0.087 ***	—
Urban, 100,000+	−0.177 ***	−0.076 **	−0.067 **	−0.081 ***	−0.084 ***	−0.104 ***	−0.091 ***	—
County with city of 25,000+	—	—	—	—	—	—	—	−0.024
Demographic Control Variables								
Mother’s age								
20–24	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
25–29	0.048 **	0.054 ***	0.046 **	−0.025 *	0.031 ***	0.055 ***	0.056 ***	0.075 ***
30–34	−0.086 ***	−0.136 ***	−0.161 ***	−0.243 ***	−0.167 ***	−0.130 ***	−0.146 ***	−0.132 ***
35–39	−0.277 ***	−0.378 ***	−0.381 ***	−0.482 ***	−0.394 ***	−0.350 ***	−0.374 ***	−0.347 ***
40–44	−0.649 ***	−0.739 ***	−0.757 ***	−0.846 ***	−0.762 ***	−0.719 ***	−0.742 ***	−0.727 ***
45–49	−1.117 ***	−1.211 ***	−1.162 ***	−1.285 ***	−1.204 ***	−1.160 ***	−1.174 ***	−1 .198 ***
Age difference from spouse	−0.008 ***	−0.008 ***	−0.007 ***	−0.010 ***	−0.009 ***	−0.008 ***	−0.008 ***	−0.007 ***
Number of Observations	20,414	29,708	37,570	48,281	133,493	86,520	66,183	28,840
R^2	.205	.233	.231	.248	.228	.221	.227	.243

Notes: OLS regression with state fixed effects and year fixed effects. The dependent variable is number of own children younger than age 5 the in household. Interactions between nativity variables and the proportion of own children biblically named (centered on mean) and nativity and church seating variables (centered on means) are not shown. Universe includes all currently married white women aged 20–49 with spouse present, living in a census region other than the Pacific and Mountain regions, and having at least one own child in the household with a valid first name.

Source: Ruggles et al. (2010).

† $p < .10$;

* $p < .05$;

** $p < .01$;

*** $p < .001$.