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Working Paper

Occupation and fertility on the frontier: Evidence from the State of Utah

Working Paper, No. 2013-02

Provided in Cooperation with:

Department of Economics, The University of Utah, Salt Lake City

Suggested Citation: Maloney, Thomas N.; Hanson, Heidi; Smith, Ken R. (2013) : Occupation and fertility on the frontier: Evidence from the State of Utah, Working Paper, No. 2013-02, The University of Utah, Department of Economics, Salt Lake City, UT

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DEPARTMENT OF ECONOMICS WORKING PAPER SERIES

**Occupation and Fertility on the Frontier: Evidence from the State of
Utah**

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Working Paper No: 2013-02

March 2013

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Abstract

The United States in the 19th century was marked by initially quite high fertility levels but also by the onset of a relatively early and steep decline in fertility. Most of what we know about these patterns in the US comes from aggregate (typically county or state level) data. We provide new, micro-level evidence on patterns of fertility change in the US in the late 19th and early 20th centuries. We use records from the Utah Population Database (Mineau 2007), particularly family history records linked to death certificates, and focus on occupational differentials in the level of, and change in, the number of children born to a woman, along with several other fertility-related behaviors. Our preliminary results suggest that there was substantial commonality in the timing of change in fertility across socioeconomic strata (as measured by spouse's occupation). Still, some differences in these behaviors across occupational classes did emerge during the era of the fertility transition. The households of white collar workers and of farmers typically defined the bounds of these behaviors, with white collar households often "leading" change and other occupational groups, including farm households, closing the gap over time.

Keywords: fertility, fertility transition, socioeconomic status, United States, history

JEL Classification: J13, N31

Acknowledgements:

Partial support for all data sets in the Utah Population Database is provided by the Huntsman Cancer Institute, University of Utah.

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December 2012

Corresponding author: Thomas Maloney, Maloney@economics.utah.edu. Prepared for a panel on "Social Class and Fertility Before, During, and After the Fertility Transition," Social Science History Association Meetings, Vancouver, B.C., November 2012. Partial support for all data sets in the Utah Population Database is provided by the Huntsman Cancer Institute, University of Utah.

The United States in the 19th century was marked by initially quite high fertility levels but also by the onset of a relatively early and steep decline in fertility. The US frontier was characterized by high fertility relative to the US norm, and regional differences between East and West are an important theme in the study of fertility patterns in the US in the 19th century. Even in the Western US, though, the move to lower levels of fertility is clearly visible among women born in the mid-1800s.

Most of what we know about these patterns in the US comes from aggregate data. Often, county- or even state-level measures of fertility (e.g., child/woman ratios) are compared to local economic and demographic parameters to gain insight into the sources of fertility differentials and to infer the sources of change over time. Guinnane's recent survey emphasizes the need for more micro-level evidence on the patterns and sources of fertility change, particularly micro-level evidence on wealth, income, and occupation differentials in fertility behavior (Guinnane 2011, p. 610). We take up this challenge by examining patterns of fertility change in the state of Utah in the late 19th and early 20th centuries. We use records from the Utah Population Database (Mineau 2007), particularly family history records linked to

death certificates, and focus on occupational differentials in the level of, and change in, the number of children born to a woman, along with several other fertility-related behaviors: age at marriage, age at first birth, age at last birth, and length of birth intervals. Our preliminary results suggest that there was substantial commonality in the timing of change in fertility across socioeconomic strata (as measured by spouse's occupation). Still, some differences in these behaviors across occupational classes did emerge during the era of the fertility transition. The households of white collar workers and of farmers typically defined the bounds of these behaviors, with white collar households often "leading" change and other occupational groups, including farm households, closing the gap over time.

Economic Determinants of Fertility Differentials in the US

While economic historians and other social scientists have examined connections between the economy and fertility behavior over the long-term in the US, the patterns that have driven these investigations have been regional rather than across occupational strata. Much of this work focuses on differences in the level of rural fertility specifically, with rural fertility increasing as one moves from East to West. In a classic examination of these patterns, Easterlin (1976) ties fertility differences to differences in the rate of change in land values and to a bequest motive on the part of parents: Where land values were rising rapidly (in the West), rural parents felt able to give several children an adequate start in life. Where land values, though high, were not rising, farm families had an incentive to limit their fertility in order to give a smaller number of sons an adequate transfer of cash or land. Sundstrom and David

(1988), in examining the same regional differences in fertility, argue that such transfers were the result of a bargaining process in which land was given to a son in exchange for support of his parents in old age. Sundstrom and David also emphasize that the specific “rate of exchange” of wealth transfers for old age support depended on the bargaining power of children and thus on the availability of alternative sources of income for these children. Where opportunities in manufacturing work were more widely available (the East, initially), children were less dependent on wealth transfers from parents and would provide less support to parents in exchange for these transfers. These facts led parents to search for other ways to support themselves in their old age, and they reduced their fertility as they increased their investment in other forms of saving.

While both of these studies connect fertility patterns in the US to economic change, they rely on aggregate data and do not directly observe fertility differentials between families in different economic circumstances. Steckel (1992) brings microdata to the examination of geographic differentials in US fertility by linking households from the 1850 US Census to the 1860 Census and calculating the number of children added by married couples during this decade. He then examines the correlation of “children added” with various measures related to Easterlin’s and Sundstrom and David’s competing hypotheses, including the value of real wealth held by the household, the extent of local manufacturing employment, and the presence of banks (as an alternative form of saving) in the state. Of these measures, banking density carries the strongest (negative) relationship with the number of children added by families in the 1850s. Steckel’s micro-level data also allow him to look at occupational differentials in fertility

behavior. He finds that the families of both white collar and skilled blue collar workers added fewer children in the 1850s than did the families of farmers or unskilled workers.

Guinnane et al (2006) also employ micro-level Census data, in their case the 1910 Census, to examine fertility differentials across groups. Their main interest is in patterns of fertility among first and second generation Irish immigrants, though they incorporate information on occupation and home ownership as well. For native born children of native parents, their occupational ranking of childbearing behavior roughly matches that found by Steckel for the 1850s: higher levels of fertility among agricultural workers and the less skilled, and lower levels among professional and clerical workers. This gradient is not present among Irish immigrants, however. Among the second-generation Irish, professional and clerical work is correlated with reduced fertility, but agricultural work is not correlated with high fertility (compared to lower skilled workers).

Murray and Lager's (2001) study of fatherhood among men who graduated from Amherst College between 1861 and 1899 turns up interesting and nuanced occupational differentials in fertility. When Murray and Lager limit their analysis to men fathering at least one child, they find that physicians had fewer children than men in other occupations (businessmen, lawyers, teachers, ministers and others). They attribute this differential to knowledge of more effective contraceptive practices among physicians, though they also note that physicians in this era often saw patients in their own (the physicians') homes, which may have created an extra incentive to limit family size.

The UPDB and Micro-level Evidence on Fertility in Utah

Micro-level studies of occupational differentials in fertility in the US in the late 1800s and early 1900s have identified some of the patterns we would likely expect: higher levels of fertility among farm families, and lower levels among professional and white collar workers. In general, these studies rely on cross-sectional evidence on fertility. Even Steckel's study, which does link individuals across Censuses and measures realized fertility in one decade, covers a fairly narrow period of time for just 638 families.

Our data come from the Utah Population Database (UPDB). The core of the UPDB is information on over 185,000 three-generation families identified on "Family Group Sheets" from the archives at the Utah Family History Library. These genealogical records provide data on migrants to Utah and their Utah descendants for more than 1.6 million individuals born from the early 1800s to the mid-1970s. The full UPDB now contains data on nearly 7 million individuals due to longstanding and on-going efforts to add new sources of data and update records as they become available. Because these records include basic demographic information on parents and their children, fertility and mortality data are extensive with coverage up to the present. Importantly for our purposes, they allow us to follow individuals from several birth cohorts throughout the course of their own childbearing, rather than limiting us to a single cross-section or a limited window of observation.¹

The UPDB has already been used to study fertility patterns on the frontier in the era of fertility transition. Bean et al (1990) collects many of the important findings from this work.

¹ More detail on the breadth and quality of each component data source is available on the UPDB website <http://www.hci.utah.edu/groups/ppr>

They do not directly incorporate occupation into their analysis but rather emphasize geographic differentials within Utah, between the more urban Wasatch front and the much more sparsely populated outlying areas, along with differentials by place of birth and by religious identity (between members of the Church of Jesus Christ of Latter Day Saints and others). Bean et al identify the 1860-1869 birth cohort as the first to be characterized by substantial fertility limitation. Fertility differentials between geographic groups increased at this time, with more persistent urban residents, especially those less attached to the church, engaging in greater fertility limitation. Within the context of these growing differentials, though, the authors also emphasize the common timing of fertility change across groups: the shift toward later marriage, later age at first birth, longer birth intervals, and ultimately smaller families was quite broad beginning in the 1860s (dating by mother's birth). They see this common timing as evidence in favor of an "adaptation" to broadly-felt social and economic changes, including the influence of a larger non-LDS population in Utah, greater residential diffusion within the state, the declining influence of charismatic founding leaders in the LDS church administration, and greater incorporation of the state into the broader US economy.

In a recently published study relying on UPDB data, Jennings et al (2012) investigate intergenerational correlations in fertility in Utah, both between mother and daughter and between mother-in-law and daughter-in-law. Correlations between mothers' and daughters' fertility emerged beginning in the 1870s, when fertility limitation was becoming more generally apparent. The authors note that these correlations could operate through "ideational change," as new values are passed from parent to child, but they could also represent the effects of

intergenerational correlation of economic status, which is not directly measured in their analysis.

Occupational Differences in Fertility in Utah

In this paper, we build on the work of these authors by adding occupation to the analysis of fertility change in Utah. Our information on occupation comes from death certificates which are linked to family history records. These death certificates begin in 1904, allowing us to identify the occupation of individuals who died in that year or later. We interpret the information on the death certificates as identifying an individual's "usual occupation" over the course of their work life.² We believe this measure of occupation to be a good indicator of socio-economic status in a way that may be superior to an occupation observed in a cross-section, such as a decennial Census. It does, though, omit any information on job change or on the variety of employments that might have been held at a point in time. This may have been especially relevant in the earlier years of the settlement of Utah, when church authorities established policies aimed at territorial self-sufficiency, which could have resulted in individuals being engaged in a variety of kinds of activity simultaneously (Bean et al p. 56-7).

Our goal is to discover whether the timing and path of the fertility transition differed by occupational group. To limit the number of confounding variables that might be at play, we restrict our sample to women who were born in Utah between 1850 and 1919; so, for instance,

² Current instructions regarding the recording of occupations on death certificates emphasize the importance of reporting the "usual" or longest-held occupation of the decedent and specifically emphasize that "retired" or "unemployed" should not be entered (US Department of Health and Human Services 2012, p. 5-6). Only about one-third of one percent of records (198 records) that otherwise met our sample selection criteria had spouses' occupations coded as "retired." We are therefore confident that a usual occupation was reported even in cases in which the individual had stopped working.

we do not consider the immigrant-native differences that Bean et al examine. We also limit our sample to women who married once, remained married to that one spouse through age 50, and had at least one child. Finally, we exclude women for whom spouse's occupation is unknown, unreported, or insufficiently detailed to classify, and for a very small number of cases in which spouses were reported to be in the military. Table 1 indicates the number of women in each ten-year birth cohort in our data set, rising from 1,470 in the 1850s cohort to over 13,000 in the 1910s cohort.

Occupations in the UPDB have been coded into categories based on the 1990 Census occupation and industry schemes. We use the occupation listing to create five broad categories of workers: white collar workers (large groups in this category include accountants and auditors, sales workers, supervisors and proprietors, and general office clerks), service workers (including protective service as well as janitors and cleaners), farmers, blue collar craft and skilled construction workers (including construction supervisors, carpenters, mining machine operators, and production supervisors), and operatives and laborers (including truck drivers, locomotive operating occupations, and undifferentiated laborers).³ Our observations begin with women born in 1850, soon after the Mormon pioneers entered the Utah territory, and the occupational distribution reflects the importance of agriculture in these early years: about two-thirds of the women in our 1850s birth cohort were married to farmers (see Table 1). By the

³ For white collar workers, we use Census 1990 occupation codes 3 to 391. For service work, we use 403 to 469. For farmers, we use 473 to 499. For craft and construction workers, we use 503 to 699. For operatives and laborers, we use codes 702 to 890. We have insufficient information to classify spouse's occupation into a 1990 Census category for 17,158 women, roughly 25% of the women who otherwise meet our selection criteria. 1,873 women are excluded because the spouse was reported as being in the military (97 records), retired (198), a homemaker (13), a student (2), a volunteer (1), not working (60), in an unknown occupation (1), or with no reported occupation (1,501).

1880s birth cohort, though, the share of these women who were married to farmers had fallen below half, and the farming share was only 15 percent among the husbands of the 1910s birth cohort. White collar occupations and both craft and operative/laborer blue collar positions grew substantially in importance in these years.

This scheme provides a rough SES ranking but also highlights other occupation-related factors that may affect the timing of family formation and fertility levels. Farm families typically “produced their own work force,” which promoted higher levels of fertility, while white collar work might require longer periods of schooling or training, which could delay family formation. Periods of training for craft workers could have a similar impact. This categorization might also map into differences in education and exposure to new ideas, though we do not have access to independent information on literacy or education level in these data.

In addition to the woman’s birth cohort and her spouse’s occupation, we control for several other factors that were correlated with family size in Utah in this era. One factor of obvious importance is membership in the LDS Church. The UPDB contains information on baptism and endowment dates from family history records, and this was used to classify individuals as active members of the church, inactive members, or non-members. Individuals were considered active church members if endowed before age 40.⁴ Individuals with a baptism but no endowment date were considered inactive. Those with no recorded baptism were considered non-LDS. Active LDS women make up about three-fourths of our sample through the 1900s cohort before falling to about 67 percent of the 1910s cohort. The inactive LDS

⁴ An endowment ceremony is a formal ceremony recognizing a high level of commitment to living in accordance with church teachings.

group grew fairly steadily in importance, rising to nearly one fifth of the sample in the 1910s cohort. The non-LDS group grew primarily in the last cohort.

Bean et al demonstrate the importance of geographic fertility differentials within Utah, so we also control for the woman's birth along the more densely populated Wasatch front (Utah, Salt Lake, Weber, and Davis counties). The Wasatch front share declines from 78 percent for the 1850s birth cohort to 46 percent among those born in the 1870s and changes little thereafter. Finally, we control for whether the woman had an occupation recorded on her death certificate. The number of women for whom an occupation was reported was less than four percent of the sample through the 1870s cohort but then rose rapidly to 29 percent among the 1910s cohort. Most commonly, these women were elementary school teachers, sales workers, secretaries, nurses, and cooks.

Before examining fertility behavior by occupational status, we present differences in children ever born along the dimensions discussed above: the woman's LDS status, her birth place, and her occupation. See Figures 1 and 2. In general, religious affiliation is correlated with fertility as we would expect, with active LDS women having just over one more child than non-LDS women on average, and with inactive LDS women having fertility levels in between these two extremes. While all of these groups experienced substantial declines in fertility between the 1850s cohort and the 1910s cohort, the gap between active LDS women and non-LDS women did not change dramatically over time (so this stable gap in number of children came to constitute a larger percentage difference as the total number of declined for all

groups). See Figure 3.⁵ The fertility gaps between working and non-working women, and between Wasatch front residents and others, were not as large as the differences by religious affiliation. These gaps tended to grow in the early years of fertility decline and then become smaller as childbearing converged somewhat across groups at a new, lower level in the 1910s cohort.

Our primary interest, though, is fertility differences across spouse's occupation. Figures 4 through 11 present measures of several fertility related behaviors grouped by the spouse's occupation and the woman's birth cohort. White collar families and farm families generally define the bounds of these behaviors. The "leadership" of white collar workers in terms of increase in age at first birth is apparent in Figure 4. Age at first birth rose by over two years for this group between the 1850s and 1870s cohorts, leveled off, and then rose again somewhat after the 1890s. The gap between white collar workers and farmers on this measure rose on net by over half a year (see Figure 10), while the other occupational groups were largely "caught" by farm families on this measure by the end of our period. Much of the early rise in age at first birth for all groups was connected to rising age at marriage, and this was particularly true of white collar families (see Figure 5). After 1870, age at marriage stopped increasing, but first birth interval (the time in months between marriage and first birth) rose considerably for all occupation groups for cohorts born after the 1890s (Figure 6), driving the renewed increase in age at first birth visible in Figure 4.

⁵ For ease of presentation, all gaps in Figures 3, 10, and 11 are presented in positive terms (as absolute values), regardless of which group had the larger value.

While the increase in first birth interval is concentrated after the 1890s, the average inter-birth interval (the average interval in months between each birth after the first) grew more gradually over time, with more modest acceleration after the 1890s (see Figure 7). The white collar – farmer gap in the length of the average inter-birth interval rose over the first four cohorts and then declined, taking on the shape associated with an innovation-diffusion pattern as the “leading” occupational group is caught to a degree by later-starting occupational groups (see Figure 11).

While white collar families are the outliers in terms of age at first birth, farm families are the outliers when we measure age at last birth (Figure 8). While the stopping age declined substantially for all categories, the gap between farmers and white collar workers grew by over two years through the 1890s birth cohort, and all other occupational groups were clustered close to white collar workers. The age at last birth then rose somewhat for white collar workers over the last two cohorts, approaching the stopping age for farm families by that point. Finally, the number of children ever born declined steadily for all occupation groups across birth cohorts from the 1850s through the first decade of the 20th century before flattening out (see Figure 9). As with most of these measures, the gap between the white collar families and farm families rose for several decades and then declined, concentrating around a new fertility level at about half the initial value (see Figure 10).

To more formally examine cross-occupational differences in the level and timing of change in these behaviors, controlling for factors such as the woman’s employment status, her religious affiliation, and her birthplace, we estimate a series of regressions identifying the

correlates of age at first birth, first birth interval, average inter-birth interval, age at last birth, and children ever born, incorporating dummy variables for spouse's occupational category and the woman's birth cohort along with interactions of occupation and cohort. We control for the woman's age at marriage, religious affiliation, place of birth (on the Wasatch front or elsewhere in Utah), and whether or not she had a reported occupation.

Results for age at first birth are found in Table 2. The main cohort effects indicate a general rise in age at first birth by the 1880s, relative to the 1850s birth cohort. Though there is some "backsliding" in the 1890s cohort, age at first birth increases across cohorts from the 1870s to the 1880s, from the 1890s to the 1900s, and from the 1900s to the 1910s (in pairwise tests using a p value of .05). There are no cross-occupational differences in the main effects. However, the rise in age at first birth for white collar families exceeded the increase for farm families in both the 1900s and 1910s birth cohorts.

Similar results for first birth interval are reported in Table 3. Not surprisingly, these match the results for age at first birth rather closely, with a general increase across cohorts visible by the 1880s, though the stagnation in the increase in the 1890s is more pronounced than for age at first birth, so that the birth interval in the 1890s cohort is not statistically different from that in the 1850s cohort. There are again no initial differences across occupations in the main effects, but white collar families are characterized by greater increases in first birth intervals, compared to farmers, by the 1900s. In this case, craft workers also develop longer first birth intervals by the 1910s.

The pattern of change for average inter-birth intervals is somewhat different (see Table 4). Here, an increase in the main cohort effects is present from 1860 on, with intervals increasing monotonically through the 1910s (without the loss of ground in the 1890s apparent in the age at first birth and first birth interval results). White collar families always have longer average birth intervals than do farm families (as is evident in the main occupation effects), but there is no statistically significant difference in the timing or path of change across occupations.

As with average inter-birth intervals, age at last birth begins to change substantially in the 1860s birth cohort, and this decline in the age at stopping is substantial and sustained through the 1900s cohort (see Table 5). There are no differences across occupations in the main effects (i.e. no differences from farm families and no other differences in pairwise tests). However, the pace of decline in age at last birth for white collar families exceeds that for farm families by the 1870s cohort, and this statistical difference persists through the 1890s cohort. Both groups of blue collar workers (craft and operative/laborer) experienced greater declines in age at last birth than did farm families in both the 1880s and 1890s birth cohorts. The differential pace of decline in age at last birth for service workers' families, compared to farm families, is of a similar magnitude. However, the number of service workers is fairly small, and none of their interaction effects are statistically significant at conventional levels. There are no differences across any other occupation pairings in the interaction effects.

Finally, the pattern of change in children ever born is similar to that in age at last birth, with statistically significant declines across birth cohorts from the 1860s on (see Table 6).^{6,7} White

⁶ We model the number of children ever born with a poisson distribution of the log of the number of children. All other models are OLS.

collar families begin with a lower level of childbearing than is found among farm families, and they also experienced larger reductions from the 1870s through the 1900s. Service workers' families had greater reductions in childbearing than did farm families in both the 1890s and 1900s birth cohorts, craft workers' families had greater reductions from the 1870s on, and operative and laborers' families had greater reductions from the 1880s through the 1900s cohorts. There are no other pairwise differences in the occupation main effects. White collar families had greater decreases in childbearing than did operative/laborer families in the 1890s cohort, though craft workers' families had greater reductions than did white collar families in the 1910s cohort.

Our control variables generally have statistically significant and right-signed coefficients. The one exception is in terms of the effect of the woman's own employment on average inter-birth interval. This effect is very small and not statistically significant. It may be that the occupation reported on these women's death certificates reflects employment before childbearing, as it affects age at first birth and first birth interval. It might also reflect employment after a desired family size is reached, as woman's own employment reduced both children ever born and age at last birth. During their childbearing years, however, these women may have remained out of the labor market, so that inter-birth intervals were not substantially affected by employment.

To summarize the patterns of correlation of fertility behavior with spouse's occupation, we find that delays in the beginning of family formation – later age at first birth and longer first

⁷All sequential pairings indicate statistically significant change: the 1870 main effect is different from the 1860 main effect, the 1880 effect is different from the 1870 effect, etc.

birth intervals – appear in general by 1880, and white collar families experienced larger increases in these measures than did farm families by the end of the period we examine. Average inter-birth intervals increased generally and steadily beginning in the 1860s cohort, and white collar families typically had longer intervals than did farm families, but there were no notable distinctions across occupations in the timing of change in these intervals. Age at last birth and the number of children ever born declined generally and continually. White collar families were “leaders” here to a degree, though most other categories of families also became distinct from farm families on these dimensions over time.

Conclusion and Discussion

While this work is at an early stage, we have uncovered some intriguing interactions between socio-economic status (as measured by spouse’s occupation) and fertility change in Utah in the era of the fertility transition. Families of white collar workers led many of these changes, particularly those relating to the starting of family life, perhaps reflecting the impact of longer periods of education and early career transitions. Farm families were particularly distinctive in the late ages at which they continued to add children and also in the number of children ever born, though like all groups they experienced considerable decline in fertility over these decades.

This work can clearly be refined and extended in a number of ways. To the extent we are able, we will incorporate information on child mortality into our analysis. Differences in the level and change in this mortality across socio-economic strata might affect our interpretation of the differentials we have found. We will also examine other forms of modeling these

behaviors, including hazard rate models of birth intervals. We need to develop a richer understanding of the economic context. For instance, agriculture's share of total employment declined dramatically during the period we are studying. It is possible that the farmers in our earliest cohorts were engaged in a variety of activities beyond agriculture, while those who remained in farming by the end may have been substantially more specialized. These kinds of changes could affect the impact of father's occupation on fertility and in particular our ability to see cross-occupational differences. Finally, we have only begun to exploit the rich resources of the UPDB. One area of likely extension will include looking at broader networks beyond the nuclear family. Might the socio-economic status of grandparents, and of parent's siblings, have had an influence on fertility behavior? While the frontier setting of our analysis, and the prominent role of a unique religious culture in this community, will require us to be cautious about the generalizability of our findings, we believe the opportunity to improve our understanding of fertility change and economic-demographic interaction through the resources of the UPDB is substantial.

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Table 1: Means for Regression Data Set and Each Birth Cohort

Variable	All Cohorts				Women Born in 1850s				Women Born in 1860s			
	Mean or %	Std. Dev.	Min	Max	Mean or %	Std. Dev.	Min	Max	Mean or %	Std. Dev.	Min	Max
Age at First Birth	23.48	4.29	14.23	54.93	20.91	3.30	15.02	43.54	22.08	3.92	14.65	54.93
Age at Last Birth	35.60	6.23	15.06	54.93	40.34	4.78	16.64	53.93	39.60	4.89	18.86	54.93
Number of Children Average Birth Interval (Months) ^a	5.02	2.91	1.00	24.00	8.95	3.04	1.00	20.00	7.82	3.05	1.00	17.00
First Birth Interval (Months)	42.79	18.69	8.97	119.93	32.28	10.22	18.40	117.75	34.53	11.98	13.23	118.73
Age at First Marriage	21.90	21.16	0.00	120.00	15.86	11.83	0.90	115.87	16.16	13.25	0.00	112.87
Age at First Marriage	21.65	3.79	14.00	53.00	19.60	3.17	14.00	42.00	20.72	3.76	14.00	53.00
Woman Born on Wasatch Front	45.87%		0	1	78.03%		0	1	52.28%		0	1
Woman had an Occupation	16.39%		0	1	3.88%		0	1	3.31%		0	1
Woman Active LDS	74.25%		0	1	81.36%		0	1	78.31%		0	1
Inactive LDS	15.24%		0	1	6.53%		0	1	9.98%		0	1
Non-LDS	10.50%		0	1	12.11%		0	1	11.71%		0	1
Spouse White Collar	29.81%		0	1	14.29%		0	1	16.89%		0	1
Service	3.96%		0	1	1.43%		0	1	2.43%		0	1
Farmer	33.26%		0	1	66.87%		0	1	62.06%		0	1
Craft	20.51%		0	1	12.18%		0	1	12.38%		0	1
Oper./ Laborer	12.46%		0	1	5.24%		0	1	6.24%		0	1
N	49,728				1,470				4,847			

^aThe calculation of inter-birth interval includes only those who had at least two births. The overall N for this group is 45,266. For each cohorts, the N's are 1,453 in the 1850s, 3,343 in the 1860s, 6,827 in the 1870s, 6,827 in the 1880s, 8,266 in the 1890s, 8,839 in the 1900s, and 11,691 in the 1910s.

Table 1: Means for Regression Data Set and Each Birth Cohort (continued)

Variable	Women Born in 1870s				Women Born in 1880s				Women Born in 1890s			
	Mean or %	Std. Dev.	Min	Max	Mean or %	Std. Dev.	Min	Max	Mean or %	Std. Dev.	Min	Max
Age at First Birth	23.34	4.23	14.49	44.14	23.63	4.16	15.22	45.80	23.27	3.98	14.23	47.79
Age at Last Birth	38.61	5.34	17.49	51.75	37.07	5.60	16.53	52.80	34.49	6.20	16.87	54.47
Number of Children	6.66	3.08	1.00	24.00	5.73	2.96	1.00	18.00	4.74	2.63	1.00	18.00
Average Birth Interval (Months) ^a	37.03	14.21	11.20	118.90	39.58	16.32	8.97	119.93	41.22	17.45	10.37	119.93
First Birth Interval (Months)	17.31	15.96	0.00	119.07	19.24	18.46	0.00	119.97	18.15	16.47	0.00	118.63
Age at First Marriage	21.88	3.93	14.00	42.00	22.02	3.79	14.00	45.00	21.74	3.64	14.00	46.00
Woman Born on Wasatch Front	46.34%		0	1	44.54%		0	1	44.10%		0	1
Woman had an Occupation	3.04%		0	1	6.11%		0	1	11.79%		0	1
Woman Active LDS	77.74%		0	1	77.32%		0	1	75.97%		0	1
Inactive LDS	12.16%		0	1	12.53%		0	1	14.03%		0	1
Non-LDS	10.10%		0	1	10.15%		0	1	10.00%		0	1
Spouse White Collar	20.41%		0	1	25.34%		0	1	30.71%		0	1
Service	2.96%		0	1	3.72%		0	1	4.34%		0	1
Farmer	53.92%		0	1	43.43%		0	1	32.60%		0	1
Craft	14.31%		0	1	17.50%		0	1	20.52%		0	1
Oper./ Laborer	8.41%		0	1	10.01%		0	1	11.83%		0	1
N	5,067				7,223				9,011			

Table 1: Means for Regression Data Set and Each Birth Cohort (continued)

Variable	Women Born in 1900s				Women Born in 1910s			
	Mean or %	Std. Dev.	Min	Max	Mean or %	Std. Dev.	Min	Max
Age at First Birth	23.60	4.56	14.43	46.66	24.15	4.37	14.77	44.76
Age at Last Birth	33.76	6.50	15.06	48.91	34.21	5.78	15.77	53.33
Number of Children Average Birth Interval (Months) ^a	3.94	2.23	1.00	17.00	3.82	1.98	1.00	16.00
First Birth Interval (Months)	47.27	20.69	10.03	119.92	48.45	20.44	10.13	119.93
Age at First Marriage	22.01	20.75	0.00	120.00	29.84	26.96	0.00	119.97
Age at First Marriage	21.76	3.96	14.00	44.00	21.67	3.68	14.00	44.00
Woman Born on Wasatch Front	41.96%		0	1	45.37%		0	1
Woman had an Occupation	24.37%		0	1	29.14%		0	1
Woman Active LDS	74.92%		0	1	67.63%		0	1
Inactive LDS	17.16%		0	1	19.67%		0	1
Non-LDS	7.92%		0	1	12.70%		0	1
Spouse White Collar	33.25%		0	1	37.83%		0	1
Service	4.71%		0	1	4.31%		0	1
Farmer	24.55%		0	1	15.41%		0	1
Craft	23.42%		0	1	25.41%		0	1
Oper./ Laborer	14.07%		0	1	17.03%		0	1
N	10,064				13,027			

Table 2: Determinants of Age at First Birth

	Coef.	Std. Err.	t	P> t	[95% Conf.Interval]	
<i>Woman's Decade of Birth</i>						
1850s	Reference					
1860s	0.010	0.066	0.14	0.885	-0.120	0.140
1870s	0.068	0.064	1.07	0.286	-0.057	0.194
1880s	0.167	0.063	2.64	0.008	0.043	0.290
1890s	0.125	0.064	1.96	0.05	0.000	0.249
1900s	0.274	0.065	4.19	0	0.146	0.402
1910s	0.741	0.067	10.98	0	0.608	0.873
<i>Spouse's Occupation</i>						
Farmer	Reference					
White Collar	0.148	0.130	1.13	0.257	-0.108	0.403
Service	-0.238	0.378	-0.63	0.529	-0.979	0.502
Craftt	0.028	0.139	0.2	0.842	-0.245	0.301
Operative/Laborer	0.040	0.203	0.2	0.842	-0.357	0.438
<i>Occupation – Birth Cohort Interactions</i>						
White Collar * 1860s	-0.015	0.153	-0.1	0.922	-0.315	0.285
*1870s	0.109	0.144	0.75	0.451	-0.174	0.392
*1880s	0.150	0.140	1.07	0.283	-0.124	0.424
*1890s	0.023	0.138	0.16	0.869	-0.248	0.293
*1900s	0.345	0.138	2.5	0.013	0.074	0.615
*1910s	0.421	0.138	3.05	0.002	0.150	0.691
Service*1860s	0.601	0.424	1.42	0.156	-0.229	1.431
*1870s	0.321	0.404	0.79	0.427	-0.471	1.113
*1880s	0.267	0.393	0.68	0.498	-0.504	1.037
*1890s	0.358	0.389	0.92	0.357	-0.404	1.120
*1900s	0.235	0.387	0.61	0.544	-0.524	0.995
*1910s	0.539	0.387	1.39	0.164	-0.219	1.296

Craft*1860s	0.014	0.166	0.08	0.935	-0.313	0.340
*1870s	0.028	0.157	0.18	0.859	-0.279	0.335
*1880s	0.095	0.150	0.63	0.529	-0.200	0.390
*1890s	-0.022	0.148	-0.15	0.881	-0.313	0.268
*1900s	0.124	0.148	0.84	0.403	-0.166	0.413
*1910s	0.267	0.147	1.81	0.07	-0.022	0.556
Op/Lab*1860s	0.023	0.237	0.1	0.923	-0.442	0.488
*1870s	0.024	0.221	0.11	0.915	-0.410	0.458
*1880s	0.096	0.215	0.45	0.656	-0.325	0.517
*1890s	-0.012	0.212	-0.06	0.955	-0.427	0.403
*1900s	0.058	0.211	0.27	0.784	-0.355	0.470
*1910s	0.168	0.209	0.8	0.422	-0.242	0.579

Woman's LDS Status

Non-LDS	Reference					
ActiveLDS	-0.692	0.026	-27.03	0	-0.742	-0.641
InActiveLDS	-0.421	0.031	-13.56	0	-0.482	-0.360
Woman born on Wasatch Front	0.030	0.016	1.92	0.055	-0.001	0.062
Age at Marriage	1.021	0.002	488.62	0	1.017	1.025
Occupation Reported for Woman	0.184	0.022	8.25	0	0.140	0.228
Constant	1.428	0.072	19.83	0	1.287	1.570

Adj R² = .841, N=49,278

Bold => p value < .05

Table 3: Determinants of First Birth Interval

	Coef.	Std. Err.	t	P> t	[95% Conf.Interval]	
<i>Woman's Decade of Birth</i>						
1850s	Reference					
1860s	-0.269	0.781	-0.340	0.730	-1.800	1.262
1870s	0.007	0.756	0.010	0.993	-1.475	1.489
1880s	1.339	0.744	1.800	0.072	-0.120	2.797
1890s	0.768	0.750	1.020	0.306	-0.703	2.238
1900s	2.694	0.770	3.500	0.000	1.186	4.203
1910s	8.430	0.794	10.610	0.000	6.873	9.987
<i>Spouse's Occupation</i>						
Farmer	Reference					
White Collar	1.27	1.53	0.83	0.41	-1.74	4.28
Service	-0.50	4.45	-0.11	0.91	-9.23	8.22
Craft	0.20	1.64	0.12	0.90	-3.01	3.42
Operative/Laborer	-0.20	2.39	-0.08	0.94	-4.88	4.49
<i>Occupation – Birth Cohort Interactions</i>						
White Collar * 1860s	-0.08	1.80	-0.04	0.97	-3.61	3.46
*1870s	1.85	1.70	1.09	0.28	-1.49	5.19
*1880s	2.19	1.65	1.33	0.18	-1.04	5.41
*1890s	0.60	1.63	0.37	0.71	-2.58	3.79
*1900s	4.47	1.63	2.75	0.01	1.28	7.66
*1910s	5.46	1.63	3.36	0.00	2.27	8.65
Service*1860s	3.62	4.99	0.73	0.47	-6.16	13.40
*1870s	1.05	4.76	0.22	0.83	-8.29	10.38
*1880s	0.72	4.63	0.15	0.88	-8.36	9.80
*1890s	1.90	4.58	0.41	0.68	-7.08	10.88
*1900s	0.05	4.56	0.01	0.99	-8.90	9.00
*1910s	3.92	4.55	0.86	0.39	-5.00	12.85

Craft*1860s	0.13	1.96	0.07	0.95	-3.72	3.97
*1870s	0.60	1.84	0.32	0.75	-3.02	4.21
*1880s	1.30	1.77	0.73	0.46	-2.17	4.77
*1890s	0.13	1.75	0.07	0.94	-3.30	3.55
*1900s	1.61	1.74	0.93	0.36	-1.80	5.02
*1910s	3.24	1.74	1.86	0.06	-0.17	6.64
Op/Lab*1860s	0.70	2.79	0.25	0.80	-4.78	6.18
*1870s	1.19	2.61	0.46	0.65	-3.92	6.31
*1880s	1.86	2.53	0.74	0.46	-3.10	6.82
*1890s	0.56	2.50	0.22	0.82	-4.33	5.45
*1900s	1.41	2.48	0.57	0.57	-3.45	6.28
*1910s	2.65	2.47	1.08	0.28	-2.18	7.49

Woman's LDS Status

Non-LDS	Reference					
ActiveLDS	-8.73	0.30	-28.96	0.00	-9.32	-8.14
InActiveLDS	-5.31	0.37	-14.52	0.00	-6.03	-4.60
Woman born on Wasatch Front	0.41	0.19	2.20	0.03	0.04	0.78
Age at Marriage	0.40	0.02	16.26	0.00	0.35	0.45
Occupation Reported for Woman	2.20	0.26	8.49	0.00	1.69	2.71
Constant	23.53	0.72	32.91	0.00	22.13	24.94

Adj. R²=.091 N=49,278

Bold => p value < .05

Table 4: Determinants of Average Inter-Birth Interval

	Coef.	Std. Err.	t	P> t 	[95% Conf.Interval]	
<i>Woman's Decade of Birth</i>						
1850s	Reference					
1860s	2.336	0.694	3.37	0.001	0.976	3.696
1870s	5.154	0.673	7.66	0	3.836	6.472
1880s	7.257	0.663	10.95	0	5.959	8.556
1890s	9.172	0.670	13.7	0	7.860	10.485
1900s	14.678	0.692	21.22	0	13.322	16.034
1910s	15.987	0.713	22.42	0	14.590	17.385
<i>Spouse's Occupation</i>						
Farmer	Reference					
White Collar	2.855	1.364	2.09	0.036	0.181	5.529
Service	0.457	3.931	0.12	0.908	-7.248	8.161
Craft	0.470	1.460	0.32	0.748	-2.391	3.331
Operative/Laborer	1.427	2.136	0.67	0.504	-2.759	5.613
<i>Occupation – Birth Cohort Interactions</i>						
White Collar * 1860s	0.433	1.608	0.27	0.788	-2.719	3.585
*1870s	1.367	1.521	0.9	0.369	-1.614	4.348
*1880s	1.988	1.467	1.35	0.175	-0.888	4.864
*1890s	0.739	1.451	0.51	0.61	-2.104	3.583
*1900s	1.054	1.454	0.73	0.468	-1.796	3.904
*1910s	-1.039	1.451	-0.72	0.474	-3.883	1.804
Service*1860s	1.901	4.448	0.43	0.669	-6.816	10.619
*1870s	2.818	4.220	0.67	0.504	-5.453	11.089
*1880s	0.215	4.103	0.05	0.958	-7.827	8.257
*1890s	1.026	4.058	0.25	0.8	-6.928	8.980
*1900s	1.316	4.047	0.33	0.745	-6.616	9.247
*1910s	0.647	4.034	0.16	0.873	-7.259	8.553

Craft*1860s	1.708	1.747	0.98	0.328	-1.716	5.132
*1870s	1.138	1.647	0.69	0.489	-2.089	4.365
*1880s	2.025	1.582	1.28	0.201	-1.077	5.126
*1890s	0.845	1.560	0.54	0.588	-2.211	3.902
*1900s	1.594	1.558	1.02	0.306	-1.460	4.647
*1910s	2.216	1.553	1.43	0.154	-0.827	5.260
Op/Lab*1860s	1.427	2.136	0.67	0.504	-2.759	5.613
*1870s	1.564	2.495	0.63	0.531	-3.327	6.455
*1880s	0.340	2.342	0.15	0.884	-4.250	4.931
*1890s	0.210	2.268	0.09	0.926	-4.235	4.656
*1900s	-1.384	2.236	-0.62	0.536	-5.767	2.999
*1910s	-0.232	2.227	-0.1	0.917	-4.597	4.133

Woman's LDS Status

Non-LDS	Reference					
ActiveLDS	-3.104	0.292	-10.63	0	-3.676	-2.532
InActiveLDS	-1.431	0.354	-4.05	0	-2.124	-0.738
Woman born on Wasatch Front	0.595	0.172	3.45	0.001	0.257	0.932
Age at Marriage	-0.446	0.024	-18.44	0	-0.493	-0.398
Occupation Reported for Woman	-0.079	0.244	-0.32	0.746	-0.557	0.398
Constant	32.951	0.645	51.05	0	31.686	34.216

 Adj. R²=.091 N=45,266

Bold => p value < .05

Table 5: Determinants of Age at Last Birth

	Coef.	Std. Err,	t	P> t	[95% Conf.Interval]	
<i>Woman's Decade of Birth</i>						
1850s	Reference					
1860s	-0.969	0.215	-4.52	0	-1.390	-0.548
1870s	-1.950	0.208	-9.39	0	-2.357	-1.543
1880s	-3.170	0.204	-15.51	0	-3.571	-2.769
1890s	-5.230	0.206	-25.37	0	-5.634	-4.826
1900s	-6.319	0.211	-29.89	0	-6.733	-5.904
1910s	-6.195	0.218	-28.38	0	-6.623	-5.767
<i>Spouse's Occupation</i>						
Farmer	Reference					
White Collar	-0.695	0.421	-1.65	0.099	-1.521	0.132
Service	-0.856	1.223	-0.7	0.484	-3.252	1.540
Craft	-0.635	0.451	-1.41	0.158	-1.518	0.248
Operative/Laborer	-0.297	0.656	-0.45	0.651	-1.583	0.989
<i>Occupation – Birth Cohort Interactions</i>						
White Collar * 1860s	-0.504	0.495	-1.02	0.309	-1.475	0.467
*1870s	-1.579	0.468	-3.38	0.001	-2.495	-0.662
*1880s	-1.761	0.452	-3.9	0	-2.647	-0.875
*1890s	-1.952	0.446	-4.37	0	-2.827	-1.077
*1900s	-0.658	0.447	-1.47	0.14	-1.534	0.217
*1910s	0.444	0.446	0.99	0.32	-0.431	1.319
Service*1860s	-0.495	1.371	-0.36	0.718	-3.182	2.192
*1870s	-1.592	1.308	-1.22	0.223	-4.156	0.971
*1880s	-1.198	1.272	-0.94	0.346	-3.692	1.295
*1890s	-1.699	1.258	-1.35	0.177	-4.165	0.768
*1900s	-1.066	1.254	-0.85	0.395	-3.524	1.391
*1910s	-0.249	1.251	-0.2	0.842	-2.701	2.202

Craft*1860s	-0.169	0.539	-0.31	0.754	-1.225	0.887
*1870s	-0.682	0.507	-1.35	0.178	-1.674	0.311
*1880s	-1.186	0.487	-2.44	0.015	-2.141	-0.232
*1890s	-1.359	0.480	-2.83	0.005	-2.299	-0.419
*1900s	-0.771	0.478	-1.61	0.107	-1.708	0.166
*1910s	-0.208	0.477	-0.44	0.663	-1.143	0.727
Op/Lab*1860s	-0.632	0.768	-0.82	0.41	-2.137	0.872
*1870s	-1.141	0.717	-1.59	0.111	-2.546	0.264
*1880s	-1.426	0.695	-2.05	0.04	-2.788	-0.065
*1890s	-1.391	0.685	-2.03	0.042	-2.734	-0.048
*1900s	-1.042	0.682	-1.53	0.126	-2.377	0.294
*1910s	-0.352	0.678	-0.52	0.604	-1.680	0.977

Woman's LDS Status

Non-LDS	Reference					
ActiveLDS	2.591	0.083	31.29	0	2.429	2.753
InActiveLDS	0.578	0.101	5.75	0	0.381	0.775
Woman born on Wasatch Front	-0.259	0.051	-5.04	0	-0.359	-0.158
Age at Marriage	0.370	0.007	54.74	0	0.357	0.383
Occupation Reported for Woman	-0.902	0.072	-12.51	0	-1.044	-0.761
Constant	31.365	0.233	134.54	0	30.908	31.822

Adj R² = .208, N=49,278

Bold => p value < .05

Table 6: Determinants of Children Ever Born

	Coef.	Std. Err.	t	P> t	[95% Conf.Interval]	
<i>Woman's Decade of Birth</i>						
1850s	Reference					
1860s	-0.075	0.013	-5.79	0	-0.101	-0.050
1870s	-0.159	0.013	-12.41	0	-0.185	-0.134
1880s	-0.255	0.013	-19.91	0	-0.280	-0.230
1890s	-0.422	0.013	-31.74	0	-0.448	-0.396
1900s	-0.603	0.014	-42.13	0	-0.631	-0.575
1910s	-0.650	0.015	-42.77	0	-0.680	-0.620
<i>Spouse's Occupation</i>						
Farmer	Reference					
White Collar	-0.076	0.026	-2.86	0.004	-0.127	-0.024
Service	-0.019	0.076	-0.25	0.802	-0.168	0.130
Craft	-0.011	0.027	-0.41	0.682	-0.065	0.042
Operative/Laborer	-0.032	0.040	-0.81	0.421	-0.111	0.046
<i>Occupation – Birth Cohort Interactions</i>						
White Collar * 1860s	-0.025	0.032	-0.78	0.435	-0.087	0.037
*1870s	-0.112	0.030	-3.7	0	-0.172	-0.053
*1880s	-0.176	0.029	-5.99	0	-0.233	-0.118
*1890s	-0.191	0.029	-6.56	0	-0.248	-0.134
*1900s	-0.135	0.030	-4.57	0	-0.193	-0.077
*1910s	-0.019	0.029	-0.64	0.524	-0.076	0.039
Service*1860s	-0.127	0.087	-1.45	0.147	-0.298	0.045
*1870s	-0.156	0.083	-1.87	0.061	-0.320	0.007
*1880s	-0.120	0.081	-1.49	0.135	-0.278	0.037
*1890s	-0.200	0.080	-2.5	0.012	-0.357	-0.043
*1900s	-0.163	0.080	-2.04	0.041	-0.320	-0.006
*1910s	-0.123	0.080	-1.54	0.124	-0.279	0.034

Craft*1860s	-0.049	0.034	-1.47	0.143	-0.115	0.017
*1870s	-0.071	0.032	-2.23	0.026	-0.134	-0.009
*1880s	-0.144	0.031	-4.7	0	-0.205	-0.084
*1890s	-0.144	0.030	-4.74	0	-0.204	-0.085
*1900s	-0.130	0.031	-4.23	0	-0.190	-0.070
*1910s	-0.114	0.031	-3.72	0	-0.174	-0.054
Op/Lab*1860s	-0.052	0.048	-1.08	0.281	-0.147	0.043
*1870s	-0.067	0.045	-1.5	0.135	-0.156	0.021
*1880s	-0.111	0.044	-2.55	0.011	-0.197	-0.026
*1890s	-0.086	0.043	-1.99	0.047	-0.170	-0.001
*1900s	-0.095	0.043	-2.21	0.027	-0.180	-0.011
*1910s	-0.064	0.043	-1.49	0.137	-0.148	0.020

Woman's LDS Status

Non-LDS	Reference					
ActiveLDS	0.277	0.007	37.77	0	0.263	0.292
InActiveLDS	0.096	0.009	10.68	0	0.078	0.114
Woman born on Wasatch Front	-0.032	0.004	-7.76	0	-0.040	-0.024
Age at Marriage	-0.045	0.001	-73.25	0	-0.046	-0.044
Occupation Reported for Woman	-0.095	0.007	-14.4	0	-0.108	-0.082
Constant	2.864	0.017	167.6	0	2.831	2.898

Generalized Linear Model, Poisson distribution. Dependent variable = Log of children ever born.

N=49,278

Bold => p value < .05











