The Motherhood Penalty at Midlife:

The Long-term Impact of Childbearing on Women's Careers

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ABSTRACT

We build on prior research on the motherhood wage penalty and consider the longer term impact of childbearing on women's careers. We utilize all 35 years of the NLS-YW panel to model patterns of labor force participation, wages and occupational status, across the adult life course as women age from their twenties to their fifties. We find that the motherhood penalty to women's careers is strongest when women are in their peak childbearing ages, but declines significantly thereafter. By the time they reach their fifties, mothers and childless women are almost equally likely to be employed; however employed childless women continue to earn significantly higher wages and work in higher status occupations than high parity mothers (but not mothers of only 1 or 2 children).

A growing body of research has shown that mothers pay a significant wage penalty for having

children (Waldfogel 1995, 1997; Budig and England 2001; Budig and Hodges 2010; Avellar and Smock

2003). The main argument is that having and raising children interferes with the accumulation of human

capital and hence the level of productivity, which then translates into lower wages. This means that

women who, as a result of having or planning to have children, either cut short their education, drop out

of the labor force for an extended period, cut back to part-time employment, choose occupations that are

more family-friendly, devote less effort on the job or pass up promotions because of time or locational

constraints, will end up achieving less than childless women who stay on track with full-time employment

and take advantage of opportunities for training and career advancement (Anderson, Binder and Krause

2003; Baum 2002; Jacobsen and Levin 1995; Gangl and Ziefle 2009; Aisenbrey, Evertsson and Grunow

2009). Those who become mothers at younger ages and go on to have more children overall are more

likely to make these kinds of accommodations in their work lives and therefore suffer greater career

penalties than do women who wait longer and have fewer children (Blackburn, Bloom and Neumark

1993; Chandler, Kamo and Werbel 1994; Taniguchi 1999; Miller, 2009). Some researchers also argue

that mothers may face workplace discrimination because of employers who believe that they are less

competent or committed to their jobs (Budig and England 2001; Correll, Benard and Paik 2007).

Unfortunately, because discrimination is so hard to measure empirically, evidence of it is typically

inferred from residual wage differences that remain after controlling for human capital (see Correll et al.

2007, for a notable exception).

Most research on the motherhood penalty has focused on wages, especially those earned by

women who are still raising their children, typically when they are in their twenties and thirties. These

studies, many of which use longitudinal data and fixed effects methods, find average wage penalties

ranging from 5% to 10% per child (Waldfogel, 1997; Budig and England, 2001; Anderson, Binder &

Krause, 2003). Much, but not all, of the motherhood wage penalty can be explained by differences in

human capital, especially education and accumulated work experience, though some evidence suggests that work effort and productivity are also important (Budig and England, 2001; Gangl and Ziefle, 2009). The penalty mothers pay also may vary across income levels, with those at the bottom of the income distribution paying a larger penalty than those at the top (Budig and Hodges, 2010). Others find that the penalties are greatest for highly skilled working mothers (Wilde, Batchelder and Ellwood, 2010).

Although we have learned a great deal from prior studies, they are limited in several important ways, including their emphasis on relatively short-term rather than long-term consequences of childbearing on women's careers, and their almost exclusive focus on wages as the only measure of economic success. We discuss each of these issues in turn.

Short- vs. Long-Term Consequences

By focusing on the peak child-rearing years (the 20s and 30s), most previous studies are able to capture short-term fluctuations in wages surrounding the birth of a child, but they are unable to determine the longer-term impacts on women's career paths. It is possible that over time, as they gain more experience balancing work and family, and as their children grow older and more independent, mothers are able to refocus on their work lives, and as a result eventually narrow the wage gap with childless women (Anderson, Binder and Krause 2003). On the other hand, mothers may suffer a growing disadvantage over time if their lack of early investment in human capital keeps them out of higher paying occupations and denies them opportunities for significant wage growth and occupational mobility. In this case, one might expect a widening of the motherhood penalty as women age into midlife (Blackburn, Bloom and Neumark 1994; Loughran and Zissimopoulos 2008). While several studies have estimated women's long-term earnings losses due to motherhood, they have been based on simulations from cross-sectional data rather than on the lived experiences of real cohorts (Davies, Joshi and Peronaci, 2000; Sigle-Rushton and Waldfogel, 2007).

In this study, we use data from the National Longitudinal Study of Young Women (NLS-YW) to model the motherhood penalty over the course of women's careers as they age through their forties and into their early fifties—a time when virtually all women will have finished bearing children and most will have seen their children either leave the home or at least enter adolescence. At this stage of the life course, women will likely have more time and opportunity for employment outside of the home compared with earlier years. The NLS-YW permits the creation of employment and wage trajectories which provide a clearer sense of how the wage gap may change during the cohort's lifetime.

Wages vs. Other Economic Outcomes

Virtually all studies of the motherhood penalty use wages as their only measure of economic success. One notable exception (Aisenbrey, et al, 2009) examines motherhood penalties in occupational status, claiming that occupation is better suited than wages for international comparisons due to governmental regulation of wages in some countries. Although wages are certainly an important economic indicator, wages reflect the extent to which local labor markets reward workers, implying that wages for the same type of work (and worker experience) may vary substantially across regions, even within the same country. In studying the impact of motherhood on women's careers, it is important to also consider both labor force attachment as well as occupational attainment and mobility.

Studies of the motherhood wage penalty adjust for work experience, as is appropriate and often focus solely on women in the labor force. But from a life course perspective, labor force participation and continuity is of interest in its own right. Many mothers continue to take some time out of the labor force when their children are young, and studies have shown that there tends to be considerable labor force churning for mothers surrounding the first and second birth (Klerman and Liebowitz, 1999). But perhaps as long as interruptions are short and early in a woman's career, except for the foregone wages in the years not in the labor force, interruptions may not be all that costly over the long term because women are not out long enough for skills to erode. In fact, there is some research to suggest that one way women

combat the "motherhood penalty" is to drop out and then go to work for a new employer. Estes and Glass (1996) show that wages are higher for mothers who change jobs than for those who do not. Achieving short departures from the labor force may be more difficult the more children a woman has. On the other hand, more children may create greater pressure for a second income later in life as those children age into adolescence. Finally, mothers may seek to minimize the effects of time out by choosing occupations with lower levels of skill depreciation, thus reducing its effect on wages (Okamoto and England 1999; Sandell and Shapiro 1980). Hence, an examination of differences in labor force trajectories across the life course for those with different numbers of children is likely to be informative.

Labor force continuity may potentially be even more important for occupational location than wages. Occupational status scores can show how well an occupation is "valued" in society, at least in terms of prestige; they also reflect the training required (education) as well as the remuneration level (earnings) for people in that occupation in general, thereby providing a broader view of the incumbent's relative success in the work world. It is possible that one's occupational achievement captures something more enduring than wages, and that high levels of occupational attainment may be even less easily recaptured than wages after years of absence from the workforce or reduced hours in the workforce. How interesting one's work is, whether one has supervisory authority over others, how much autonomy and control one has over one's work may accumulate over a career, making it difficult for those who take time out of the labor force or cut back on work hours to rear children to be as well-positioned occupationally later in life than those who do not make these types of adjustments. Some suggestion of this comes from comparative work that shows that in countries, such as Sweden, where parental leaves are generous, occupational gender segregation is actually higher than in countries, such as the U.S., where there are limited leave protections for childrearing (Mandel and Semyonov, 2005, 2006). In our work, we consider both the wage and occupational penalties of motherhood.

In summary, this paper builds on prior research on the motherhood wage penalty by considering the long-term association between motherhood and careers across the adult life course as women age

from young adulthood to their early fifties. Unlike some studies that have simulated long-term effects from cross-sectional data, we examine actual career trajectories to compare the work experiences of childless women with mothers of different parities. In addition to wage trajectories, we consider patterns of labor force participation, and occupational status across the 35 years of the NLS-YW panel. Our key focus throughout the analysis is on changes over the life course in the relationship between motherhood and women's career outcomes, paying particular attention to how much of the penalty is explained by human capital accumulated across respondents' lives.

Our goal is to describe how labor force outcomes "play out" over a mother's life time. We appreciate that women make choices and thus self-select (either intentionally or inadvertently) into different "career" trajectories. Description of these lifetime trajectories is illuminating and largely missing from the literature, a literature that has focused to date most often on trying to control for selection, rather than illustrate its consequences.

DATA AND MEASURES

The data for the analysis come from the National Longitudinal Study-Young Women cohort (NLS-YW). The original NLS-YW cohort is based on a national sample of 5,159 women who were ages 14-24 in 1968. These women were born between 1944 and 1954, and were the leading edge of the baby boom generation. They are part of an especially interesting cohort because they came of age right at the time that women's work and family roles were being redefined by the civil rights and women's movements of the 1960s and early 1970s. The NLS-YW cohort was re-interviewed either every year or every other year until the final interview in 2003 when they were ages 49-59. The NLS-YW is well-suited for the present analysis because it follows the cohort long past the intensive childrearing stage of life and therefore permits the assessment of longer-term outcomes than was possible in previous studies. It also includes detailed employment and family information collected repeatedly throughout the adult lives of the respondents.

Because our ultimate goal is to model cumulative change throughout the adult life course, we define our initial sample quite broadly as women who participated in at least 2 interviews between the initial wave in 1968 and the final wave in 2003. With attrition over time, this yields a sample with declining numbers of observations as women grow older. Because only half the sample had an interview after age 54 (since they were 49-59 at their last interview), we set the upper limit of our analytic sample at age 54, thereby allowing us to look at women in their "early fifties". Dropping women over age 54 also limits the potential bias due to early retirement which occurs increasingly by the late-fifties. Sensitivity analyses (available upon request) show that this age restriction does not change our results in a substantive way. We start with as many as 4,860 women who provided data during their twenties, and this declines to 3,060 women in their early fifties (3,029 in models with a full set of covariates). In order to examine variation in outcomes by motherhood status over the life course, we pool all the observations with valid data and test for Age x Parity interactions; we also stratify by age and run models separately for women during their twenties, thirties, forties and early fifties.

Our dependent variables reflect a range of employment outcomes measured each year: labor force participation, hourly wages and occupational status. A woman was considered to be currently employed if she answered "working" to the question *"What where you doing most of last week – working, going to school, or something else?"* Hourly wages have been obtained by dividing the annual work-related income by the number of weeks worked and the usual number of hours worked per week. For those women missing any of these variables but who gave an "hourly rate of pay", hourly wages have been imputed using an adjusted version of the latter. All wages are expressed in 1990 dollars, and we use the natural log of wages in the regressions. We measure occupational status using the Hauser-Warren Socioeconomic Index (HWSEI) which incorporates 1990 Census occupational codes and occupational prestige ratings as reported in the 1989 General Social Survey (Hauser and Warren, 1997). The scale is a composite measure created by regressing occupational prestige ratings on occupational earnings and

education, and then using the results to generate socioeconomic scores for all of the 1990 detailed occupation categories. Values range from 0 to 80.[1]

Key independent variables include the number of children ever born (or adopted), as reported at each interview. This time varying measure is coded categorically thereby allowing the comparison of childless women with those who have one, two, or three or more children.

Measures of human capital include educational attainment, reflecting the highest level attained by a given year. Women are categorized as having completed less than high school, a high school degree, some college, or at least a 4-year college degree. Cumulative work experience is calculated for each year by adding the annual number of weeks worked since the previous interview to the previous year's cumulative total, and adjusting for potential weeks worked prior to 1968.[2] While most women worked full-time, many spent some time in part-time jobs during their careers. We gauge the amount of time and intensity of part-time work throughout a woman's career by tallying the proportion of interviews in which a woman reported working in part-time jobs with fewer than 20 hours per week or part-time jobs with 20-34 hours per week.[3] A final measure of human capital reflects on-the-job training received over time and is calculated as the cumulative number of weeks of job training completed as of each interview.

In addition to measures of fertility and human capital, we also include controls for race (white vs. nonwhite), as well as the following time-varying demographic characteristics: age at interview, coded continuously and then grouped into decades reflecting the twenties, thirties, forties and early fifties; marital status at each interview, coded as married vs. nonmarried (including never- and previously married); and husband's income (measured in thousands of 1990 dollars and coded as zero for unmarried women). We include husband's income to index the financial well-being of the family in the absence of a mother's earnings.

METHODS

We start by presenting summary characteristics for the NLS-YW cohort at around age 50. Since the values on most variables in our analysis change and/or accumulate over time (e.g., fertility, wages, work experience), we chose age 50 because it is after women have completed their childbearing, and it is towards the end of our observation window (i.e., respondents were ages 49-59 at their last interview in 2003, so virtually all remaining women in the sample provided information at around age 50). Throughout the analysis, however, we utilize the full longitudinal data collected from women up through age 54, who were interviewed at least twice, between 1968-2003, including those who dropped out prior to the end of the study.

The full data are presented graphically in a series of career trajectories by parity which show how women's labor force participation, wages and occupational attainment vary by motherhood status throughout women's adult lives. These figures reveal clear changes over the life course in the relationship between motherhood and employment outcomes. We pursue these changes further in the multivariate analysis which test explicitly for age differences in the relationship between motherhood and the three employment outcomes. We start by pooling all of the respondents' observations between ages 20 and 54, and include age-dummies reflecting sequential decades of the life course (i.e., twenties, thirties, forties and early fifties). The key test of whether the motherhood penalty varies over the life course is determined by interactions between the age-dummies and the motherhood/parity variables. In addition to presenting the interaction results, we also present stratified models run separately by age-decade to facilitate comparison of effects. All models are run in two steps, first with demographic controls and then controlling for human capital, thus allowing us to determine how much of the motherhood penalty can be explained by human capital. Results are weighted for attrition and standard errors have been corrected for correlation between observations from the same individual.

We use logistic regression for the labor force participation models and ordinary least squares regression for the wage and occupational attainment models. Many previous studies of the motherhood penalty have used fixed effects models to control for fixed unobservable characteristics that may be influencing both fertility and employment outcomes, thereby producing spurious motherhood effects. To the extent that we can, we follow this approach, though we do not use fixed effects for our final estimates for several reasons. First, on theoretical grounds, we believe that the most likely unobservable characteristics influencing both fertility and employment are attitudes and preferences about work and family, neither of which can be assumed to remain fixed over the life course, especially as women have children, discover both the costs and benefits of mothering, and encounter the difficulties inherent in combining paid work with childrearing (Gerson, 1986; Hakim, 2002; Shaw and Shapiro, 1987). Young women who had hoped to be stay-at-home mothers may change their minds because of the growing acceptability and opportunities for maternal employment or because of an unanticipated need for them to find a job (e.g., divorce, an unemployed husband). Career-oriented women, who assumed that they would work throughout adulthood, may think otherwise after experiencing the emotional pull of mothering and feeling the strains of balancing work and family.

Second, we recognize that there may be unobservable characteristics other than attitudes and preferences that remain fixed over time and influence both fertility and employment. However, based on the findings from previous motherhood penalty research, there do not appear to be clear and systematic fixed effects influencing the wage models. Some studies find that fixed effects estimates are larger than OLS estimates (Budig and England, 2001), while others find that they are smaller (Anderson et al. 2003), and yet others find that they are both larger and smaller depending on the dataset used and on parity (Avellar and Smock, 2004; Waldfogel, 1997). But none of these studies finds that fixed effects results change the conclusions they would have drawn based on either the sign or significance of their OLS estimates.

Nonetheless, if we could estimate fixed effects for our models, we would do so, if only to be consistent with previous research. However, in order to estimate motherhood fixed effects over the life course, the motherhood variables would need to fluctuate throughout the entire observation period (until the mid-fifties). Since most women (especially in the NLS-YW cohort) have their children in their twenties and thirties, there is little variation in fertility after the thirties, making it impossible to estimate fixed effects for the ages in which we are most interested (the forties and early fifties). In fact, we estimated fixed effects for the twenties and thirties decades and found results that were quite similar to previous research (Waldfogel, 1997; Budig and England, 2001; Avellar and Smock 2004), as well as to the simpler models that we present here. Although we could have presented a combination of fixed effects and non-fixed effects models for different stages of the life course, we felt it made more sense to use the same approach throughout. Thus, we estimate ordinary least squares and logistic regression models and offer tentative interpretations.

RESULTS

Descriptive results

Table 1 presents means and distributions for all women at around age 50[4] and then separately by parity, thus allowing a comparison of childless women with women who had one, two or three or more children. The majority of the 2,244 NLS-YW respondents who were interviewed at age 50 were white (72.2%), though fewer than two-thirds were currently married (61.2%). About two-thirds of respondents (65.7%) were currently employed, and among those employed, they earned an average of $10.90 per hour (in 1990 dollars), and worked in an occupation of the same average prestige level (i.e. HWSEI=37) as a clerk or business operator. The cohort had an average of just under 2 children per woman (1.97), including over one-in-six (18.2%) who remained childless. About half of the cohort had attended college, though only one in four (26.4%) completed a BA or higher degree. By age 50, they had accumulated an

average of almost 20 years of work experience, much of it full-time, and almost a year's worth of on-the-job training.

Table 1: Descriptive Statistics at Age 50, All Women by Parity: NLS-YW, 1968-2003.

Not surprisingly, women's characteristics appear to vary systematically by motherhood status and parity. Compared with mothers, childless women at age 50 are better educated, earn higher wages, and work in higher prestige occupations, though they are also much less likely to be married. At age 50, childless women are somewhat less likely than mothers of 1 child (and no different than mothers of 2 children) to be currently working. In many ways, childless women have accumulated similar work experience as mothers with only one child (e.g., both have had about 22 years of work experience and 1 full year of on-the-job training), yet this stands in stark contrast to high parity women (with three or more children) who have accumulated only 17 years of work experience and only .74 years of job training by age 50.

Whereas Table 1 displays the relationships between parity and a number of characteristics at age 50, our underlying goal is to understand how the relationships between motherhood and career outcomes change throughout women's lives. Figures 1-3 show career trajectories by parity for the NLS-YW cohort as it progressed from age 20 to age 54. We determine a woman's parity at each age (rather than as completed fertility), so individuals start on the childless trajectory (unless they had a child before age 20) and gradually move to higher parity trajectories as they have additional children. Figure 1 shows the percentage of women who are employed at each age by their current parity (based on five-year moving averages). Not surprisingly, childless women have the highest rates of employment, which reach their peak at around 80% in the mid-twenties and remain high into the forties. Among mothers, parity is inversely related to employment with high parity women having the lowest employment rates throughout the life course. By their mid-forties, the employment rates for childless and low parity women (1 or 2 children) become virtually indistinguishable, and remain only marginally higher than the rates for higher

parity (3+children) women. By their mid-fifties, we see employment rates of roughly 60-65% for all

parity groups, including childless women.

Figure 1: Proportion Employed by Current Fertility (NLS-YW 1968-2003).

Whereas parity differences in employment trajectories were large at younger ages and then

narrowed by the fifties, we see almost the opposite pattern for wage trajectories (Figure 2) and

occupational prestige (Figure 3). At younger ages, the wage differences by parity were relatively small

(though the relationship was always inverse), yet at older ages the wage gap had widened substantially.

Childless women saw steady increases in average wages from their twenties until about age 50 when they

reached almost $14 per hour (in 1990 dollars). After age 50, childless women's wages declined

somewhat, possibly due to shifting to lower paying part-time jobs, or the selective retirement of high

earning women with continuous labor force careers. Working women with only 1 child saw their wages

increase steadily until about age 40 after which they stagnated at about $11 per hour. Women with 2

children saw only minor increases in wages up to about age 35 after which they increased steadily and

equaled the wages of women with one child in their early fifties. Women with three or more children saw

modest wage increases between ages 30 and 45, but their wages remained relatively stable at between $8

and $9 per hour, after age 45.

Figure 2: Wage Trajectories by Current Fertility (NLS-YW 1968-2003).

Figure 3 shows that parity differences in occupational prestige trajectories are similar to the

patterns seen for wages, except for being smoother and more distinct. Childless working women are at a

clear occupational advantage throughout the life course whereas high parity working women are at a clear

disadvantage.   By their early forties, the occupational prestige gap between working women with one or

two children virtually disappears, and by their fifties, these two groups of working mothers narrow the

gap with childless women, something that does not happen for mothers with 3 or more children. In

summary, Figures 1-3 show that women's career outcomes differ substantially by their childbearing patterns, though these patterns change over time. There is convergence by parity in labor force attachment by the fifties, but differences in both wages and occupational prestige grow larger with age, with high parity working women falling behind all other women in their twenties and thirties, and remaining at lower levels into their forties and early fifties. At the same time, differences between lower parity and childless working women become narrower.

Figure 3: HWSEI Occupational Prestige Scores by Current Fertility (NLS-YW 1968-2003).

Multivariate analysis

To further explore these patterns, we now turn to multivariate models examining age differences in the relationship between motherhood and our three career outcomes: labor force participation, wages and occupational prestige. Our initial models pooled all of the respondents' observations between ages 20 and 54, and included age-dummies reflecting sequential decades of the life course (i.e., twenties, thirties, forties and early fifties), and interactions between the age-dummies and the motherhood/parity variables. Results from these pooled interaction models are presented in Appendix Tables 1-3. A quick perusal of these tables shows many significant interaction terms, especially in the labor force participation (Appendix Table 1) and occupational status models (Appendix Table 3). In general, the negative effects of motherhood and higher parity on all three career outcomes are greatest when women are in their twenties, with positive, and often significant, interaction effects becoming progressively stronger at older ages, thus implying a weakening of the motherhood penalty with age. In fact, the large positive interaction terms for the decades of the forties and early fifties suggest that, holding all else equal (especially education and work experience), working mothers are more (not less) likely to be employed in higher wage and higher prestige occupations than working childless women at older ages.

Appendix Table 1: Unstandardized Logit Coefficients PredictingWomen's Participation in Paid Work: NLS-YW, 1968-2003 (pooled).

Appendix Table 2: Unstandardized OLS Coefficients Predicting Working Women's Hourly (ln)Wage: NLS-YW, 1968-2003 (pooled).

Appendix Table 3: Unstandardized OLS Coefficients Predicting Working Women's Occupational Prestige Score (HWSEI): NLS-YW, 1968-2003 (pooled).

To facilitate interpretation of the interaction results, we have also run separate models by age-decade thereby permitting a direct comparison of the effects of all variables at different stages of the adult life course. Results for these models are presented in Tables 2-4 which include for each age-decade both a simpler "gross" model showing the coefficients for children ever born with only a few demographic controls, as well as a "full" model which also includes important measures of human capital (i.e., education, on-the-job training, and work experience).

As we saw in Figure 1, the negative relationship between motherhood and labor force participation is greatest during the peak childbearing years during the twenties and thirties, but weakens at later ages (Table 2). Not surprisingly, the results in the full models in Table 2 show that part but not all of the "motherhood penalty" on current employment can be explained by differences in prior human capital investments in education and work experience. The full models for the forties and fifties decades suggest that when we compare women with the same human capital, the mothers with two or more children are actually *more* likely to be employed than childless women. Needless to say, most mothers with 2 or more children are not as well-educated and do not accumulate the same amount of work experience as childless women (see Table 1), and those who do are probably very committed to being employed. Or put another way, childless women without a college degree who accumulate the same lower levels of work experience as mothers of 2 or more children may be negatively selected on other unmeasured characteristics associated with a weaker attachment to the labor force at older ages. We return to issues of selectivity in the discussion.

Table 2: Unstandardized Logit Coefficients Predicting Women's Participation in Paid Work throughout the life-course (pooled by decade): NLS-YW, 1968-2003.

Turning next to the wage results in Table 3, we can see from the gross effects of children ever born that the motherhood wage penalties persist into the forties, but are much weaker in the fifties (only the employed mothers with 3 or more children earn significantly lower wages than employed childless women). However, once we control for human capital and especially work experience (in the full models), we can see that, consistent with prior research, the motherhood wage penalty is largely explained away by the thirties (all except for women with 3 or more children), and it is completely explained away by the forties. By the early fifties, we again see that when we compare employed women with the same human capital and experience, the mothers with 2 or more children actually earn higher wages than do childless women.

Table 3: Unstandardized OLS Coefficients Predicting Women's (ln) Hourly Wage throughout the life-course (pooled by decade): NLS-YW, 1968-2003.

The results for occupational prestige in Table 4 are similar to the results for wages, to the extent that the motherhood penalty declines with age and is largely explained by differences in human capital and work experience. However, we find a steadier decline with age in the gross motherhood penalty for occupation than for wages (recall that for wages, the gross penalty remained stable through the forties and then declined in the fifties). This steady decline with age in the motherhood penalty on occupational prestige is highly significant as indicated by the significant age-decade*children ever born interaction effects in Appendix Table 3. Controlling for human capital and other covariates reduces the motherhood penalty on occupational status in every decade, eliminating its significance in the thirties and forties, and revealing the same kind of 'premium' to motherhood that we saw for employment and wages in the early fifties.

Table 4: Unstandardized OLS Coefficients Predicting Women's HWSEI Occupational Prestige Score throughout the life-course (pooled by decade): NLS-YW, 1968-2003.

In sum, the findings show that, net of human capital and work experience, the motherhood penalty to women's careers does not remain fixed over time. However, we also find that the effects of human capital taper off at older ages. For example, the positive effects of work experience on all three career outcomes are strongest when women are in their twenties, but they drop off in the thirties and remain weaker (and less significant) through the early fifties. Interestingly, the negative effects of part-time work on both wages and occupational attainment appear to accumulate over the life course, producing their strongest effects in the early fifties.

SUMMARY AND CONCLUSIONS

We find that the impact of motherhood is strongest when women are in their peak childbearing ages, but it declines significantly thereafter. These findings are robust across three important market outcomes: labor force participation, wages and occupational status. By the time they reach their fifties, mothers and childless women are almost equally likely to be employed, however women who have remained childless continue to earn significantly higher wages and work in higher status occupations than high parity mothers (but not mothers of only 1 or 2 children). Consistent with previous studies, we find that much of the motherhood penalty can be explained by differences in human capital, especially education and accumulated work experience.

The motherhood penalty can conceptually be divided into at least two components. Having children may lead women to curtail their education or drop out of the labor force, either temporarily or more permanently, thereby reducing their years of accumulated work experience. These productivity related factors are measured in surveys like the NLS-YW that we use in this research and typically explain a significant portion of the wage (or occupational attainment) gap between childless women and mothers. Virtually all the research (including the present study) comparing mothers to childless women finds these factors to be part of the explanation for mothers' lower wages and lower occupational status (Budig and England,2001; Budig and Hodges, 2010; Waldfogel 1995, 1997).

Prior research has also found that for women at younger ages, in their twenties or thirties or even their early forties, mothers have lower wages than those who do not have children even after controlling for educational attainment and work experience. Thus, in much of the literature, the motherhood penalty has also come to define the (unexplained) lower wages of mothers compared with childless women even after productivity related factors are controlled. This portion of the wage gap could still be due to unmeasured productivity differences, if, for example, motherhood diverts one's energy and commitment away from the job (Evertsson & Breen, 2008), but it also could be due to differential treatment or discrimination, as suggested in the work of Correll et al. 2007.

In this paper, looking across women's work and family careers, we certainly see that children are "costly" in terms of labor force participation when women are in their twenties and thirties, and, for higher parity women, in their forties. The associations of motherhood with wages and occupational attainment, unconditioned on educational attainment and work experience, are negative throughout the life course (though perhaps not as significantly once women reach their fifties). But our findings suggest that once we condition on the pathways through lower educational attainment and lower accumulated work experience of mothers compared with childless women, this second portion of the motherhood gap – the one not associated with measured productivity factors – tends only to be present when women are in their earlier childbearing years (in their twenties and thirties for wages and only in their twenties for occupational attainment). Later on, any difference is fully attributable to the lower investment of mothers compared with childless women in their education, their lower accumulation of on the job training and work experience. We show that there is no penalty to explain, net of productivity related factors, once women reach their forties. In their fifties, if anything, we must explain a wage and occupational premium for mothers, net of productivity related factors. Hence, our research adds a layer of complexity to the existing literature that has to date mostly focused on younger mothers still in their childbearing years.

The apparent career "premium" for older mothers, net of human capital is intriguing and worthy of further investigation. One possible explanation for this surprising finding is the changing selection into

childlessness at older ages. As in previous research on the motherhood wage penalty, we have constructed our longitudinal dataset so that women are coded as childless until the birth or adoption of their first child. Hence, many of the "childless" women in their 20s and early thirties will become mothers later in life, at which time they will leave the childless category. Because women who delay their first births tend to be more career oriented and also invest more heavily in human capital in early adulthood than do mothers who have earlier first births, their eventual transition to motherhood effectively enhances the ranks of older mothers and depletes the ranks of older childless women of many of the individuals who would be most successful in the market. Moreover, childless women in their forties or fifties are an interesting combination of those who remained childless voluntarily (positively selected for having chosen a career or other pursuits instead of motherhood), and those who "ended up" childless against their own will (negatively selected either because of infertility, poor health, the inability to find a suitable partner, or family demands such as caring for aging or disabled relatives, all of which might also affect their market performance). Therefore, the composition of childless women is likely to change substantially at older ages, becoming less positively selected than it had been at earlier ages. This shift, along with the growing positive selectivity of mothers, could help to explain the premium that we observe for mothers in their fifties. Previous research, by focusing on a narrower window in women's lives (the twenties and thirties) was not well-suited to detect these longer-term compositional shifts in the classification of women into childlessness and motherhood. By expanding the window of observation into the forties and early fifties, we have been able to unveil a potentially important underlying mechanism driving comparisons between mothers and childless women. Future research is required to fully substantiate the validity of this suggestive interpretation.

Our findings also point to several other important areas for further investigation. First, we highlight the multidimensional examination of later life outcomes that is needed to provide a full picture of any life course "motherhood penalty." Not only wages, but occupational standing, and employment levels all need to be considered to assess where women with different childbearing trajectories "end up."

In further work, it would also be important to consider their accumulated assets and pension benefits and, related, their marital history which also connects them to later life benefits and well-being. Finally, more attention should be paid to the selectivity of employment, especially at older ages. In past research that evaluated the "motherhood penalty" among younger women in their twenties and thirties, all women were observed at ages when labor force attachment was strong for women and retirement was not yet an option. When moving to later life stages and accumulated careers, the differential timing of retirement that is afforded those with strong attachment and "good jobs" with (early) retirement options becomes a more important part of the story. In future work, this also needs to be better conceptualized and explored in order to adequately compare trajectories and economic outcomes of those with differing work and family careers.

NOTES

[1] IPUMS website: http://usa.ipums.org/usa/chapter4/chapter4.shtml

[2] We measure potential labor force participation prior to the baseline survey, following Waldfogel (1997).

[3] Because our sample includes women who responded to different numbers of interviews, these percentage measures of part-time employment may reflect differing portions of women's careers. However, we believe this is more justifiable than using the total number of years in part-time work which would be highly correlated with the total number of years worked.

[4] Because the NLS-YW conducted interviews in alternating years, about half of all respondents were not interviewed exactly at age 50 (they were interviewed at ages 49 and 51). For this reason, Table 1 presents average responses for interviews occurring between ages 46-54.

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Table 1. Descriptive Statistics at Age 50, All Women and By Parity: NLS-YW, 1968-2003.

	All Women	Childless Women	1 Child	2 Children	3+ Children
N [1]	2,244	408	423	744	669
%	100	18.2	18.9	33.2	29.8
Career Outcomes					
Labor Force Participation (% employed)	65.7	67.4	69.2	67.4	61.5
Hourly Wages	10.9	13.6	11.3	11.3	9.1
Occupational Prestige (HWSEI index)	37.4	40.8	38.6	38.7	33.9
Fertility					
Children Ever Born	1.97	0	1	2	3.74
Highest Educational Degree					
Less than High School	11.5	6.9	8.3	9.5	18.7
High School graduate	37.8	28.7	36.2	40.1	41.9
Some college	24.3	22.6	27.9	26.5	20.6
College grad and beyond	26.4	41.9	27.7	23.9	18.8
Work Status, Work Experience & Training					
Years of Cumulative Work Experience	19.6	22.2	21.9	19.8	17.0
% observed in Low-Part-Time jobs (<20 hrs/week)	12.2	9.8	9.1	13.1	14.2
% observed in High-Part-Time jobs (20-34 hrs/week)	16.3	12.1	13.5	16.8	19.4
Weeks in Job Training	45.1	51.9	53.0	44.5	38.2
Sociodemographic Controls					
Race (% White)	72.2	74.8	68.1	79.2	66.1
Marital Status (% Married)	61.2	39.2	57.2	69.9	64.9
Husband's income (in thousands of 1990 dollars)	15.2	9.0	13.3	17.8	16.7

[1] Women with valid interview(s) between the ages of 46 and 54. Since interviews where carried out every 2/3 years, there is not data for all women at exact age 50. In this table, we have calculated average values for each woman around age 50 (specifically between ages 46 and 54) and then computed means across women by parity.

Table 2. Unstandardized Logit Coefficients Predicting Women's Participation in Paid Work throughout the life-course (pooled by decade): NLS-YW, 1968-2003. [2]

	TWENTIES		THIRTIES		FORTIES		EARLY FIFTIES	
	Gross	+ Human Capital	Gross	+ Human Capital	Gross	+ Human Capital	Gross	+ Human Capital
N [2] =	4,860	4,523	4,163	4,073	3,717	3,672	3,060	3,029
Person-year observations =	29,656	26,318	20,379	19,712	15,135	14,922	5,921	5,859
Children Ever Born (ref. *Childless*)								
One child	-1.063 ***	-0.886 ***	-0.495 ***	-0.434 ***	0.086	0.059	0.139	0.102
Two children	-1.713 ***	-0.854 ***	-0.872 ***	-0.396 ***	-0.044	0.245 *	0.205 ^	0.411 **
Three or more children	-2.062 ***	-0.798 ***	-1.402 ***	-0.549 ***	-0.427 ***	0.227 *	-0.038	0.531 ***
Highest Educational Degree (ref. *Less than HS*)								
HS graduate		0.499 ***		0.349 ***		0.309 **		0.158
Some college		0.422 ***		0.386 ***		0.272 *		0.228
College grad and beyond		1.596 ***		0.610 ***		0.137		-0.195
Work Status, Cumulative Experience & Training								
Years of Work Experience		0.728 ***		0.269 ***		0.249 ***		0.191 ***
Years of Work Experience squared		-0.031 ***		-0.003 **		-0.004 ***		-0.002 ***
% observed in low-part-time jobs (<20 hrs/week)		-2.064 ***		-1.023 ***		-0.906 ***		0.039
% observed in high-part-time jobs (20-34 hrs/week)		-0.606 ***		0.454 ***		0.320 *		0.443 *
Years in Job Training		0.145 *		-0.016		0.059		0.111 ^
Years in Job Training squared		-0.016 *		0.003		-0.007		-0.014
Sociodemographic Controls								
Age in years	0.145 ***	-0.174 ***	0.035 **	-0.031 *	-0.014	-0.054 ***	-0.055 **	-0.106 ***
Race (non-hispanic white=1; other=0)	-0.276 ***	-0.238 ***	-0.131 *	-0.076	0.232 **	0.267 ***	0.369 ***	0.418 ***
Marital Status at interview (married=1; other=0)	-0.218 ***	-0.363 ***	-0.084	-0.211 **	-0.188 **	-0.251 ***	-0.223 **	-0.310 ***
Husband's income (in thousands of 1990 dollars)	0.000	-0.001	-0.011 ***	-0.013 ***	-0.005 ***	-0.01 ***	-0.001	-0.002 ^

^p<0.1; *p<0.05; **p<0.01; ***p<0.001

[1] All models include controls for calendar year.

[2] Women with at least two valid interviews between ages 20 and 54. Results are weighted for attrition, and standard errors corrected for correlation among observations for the same individual.

Table 3. Unstandardized OLS Coefficients Predicting Women's (ln) Hourly Wage throughout the life-course (pooled by decade): NLS-YW, 1968-2003. [2]

	TWENTIES		THIRTIES		FORTIES		EARLY FIFTIES	
	Gross	+ Human Capital	Gross	+ Human Capital	Gross	+ Human Capital	Gross	+ Human Capital
N [2] =	4,357	4,346	3,723	3,723	3,339	3,339	2,444	2,444
Person-year observations =	18,989	18,942	14,821	14,818	11,814	11,814	4,460	4,460
Children Ever Born (ref. *Childless*)								
One child	-0.178 ***	-0.066 **	-0.115 ***	-0.006	-0.113 **	0.011	-0.039	0.071
Two children	-0.308 ***	-0.085 **	-0.281 ***	-0.051 ^	-0.226 ***	0.005	-0.047	0.191 **
Three or more children	-0.463 ***	-0.121 ***	-0.470 ***	-0.116 ***	-0.402 ***	-0.023	-0.264 ***	0.120 ^
Highest Educational Degree (ref. *Less than HS*)								
HS graduate		0.283 ***		0.182 ***		0.199 ***		0.191 **
Some college		0.399 ***		0.342 ***		0.386 ***		0.382 ***
College grad and beyond		0.696 ***		0.554 ***		0.629 ***		0.639 ***
Work Status, Cumulative Experience & Training								
Years of Work Experience		0.075 ***		0.038 ***		0.022 ***		0.023 *
Years of Work Experience squared		-0.003 ***		0.000		0.000 ^		0.000
% observed in low-part-time jobs (<20 hrs/week)		-0.026		-0.232 ***		-0.369 ***		-0.684 ***
% observed in high-part-time jobs (20-34 hrs/week)		-0.072 *		-0.264 ***		-0.308 ***		-0.293 **
Years in Job Training		0.093 ***		0.040 **		0.054 **		0.068 **
Years in Job Training squared		-0.005 ***		-0.002 ^		-0.005 *		-0.006 *
Sociodemographic Controls								
Age in years	0.054 ***	0.003	0.009 *	-0.015 ***	-0.005	-0.026 ***	-0.019 ^	-0.035 **
Race (non-hispanic white=1; other=0)	-0.085 ***	0.062 **	-0.012	0.004	0.074 **	0.084 **	0.135 **	0.161 ***
Marital Status at interview (married=1; other=0)	-0.082 ***	-0.059 **	-0.173 ***	-0.146 ***	-0.148 ***	-0.105 ***	-0.239 ***	-0.190 ***
Husband's income (in thousands of 1990 dollars)	0.007 ***	0.006 ***	0.005 ***	0.003 ***	0.006 ***	0.004 ***	0.007 ***	0.006 ***

^$p<0.1$; *$p<0.05$; **$p<0.01$; ***$p<0.001$

[1] All models include controls for calendar year.

[2] Working women with at least two recorded wages between ages 20 and 54. Results are weighted for attrition, and standard errors corrected for correlation among observations for the same individual.

Table 4. Unstandardized OLS Coefficients Predicting Women's HWSEI Occupational Prestige Score throughout the life-course (by decade): NLS-YW, 1968-2003. [2]

	TWENTIES		THIRTIES		FORTIES		EARLY FIFTIES	
	Gross	+ Human Capital	Gross	+ Human Capital	Gross	+ Human Capital	Gross	+ Human Capital
N [2] =	4,735	4,501	4,066	4,020	3,585	3,572	2,515	2,515
Person-year observations =	28,028	25,986	19,903	19,507	13,708	13,659	4,666	4,666
Children Ever Born (ref. *Childless*)								
One child	-4.906 ***	-0.536 *	-3.982 ***	-0.127	-3.078 ***	0.493	-1.745	1.998 *
Two children	-7.953 ***	-0.766 *	-5.615 ***	0.618	-4.154 ***	0.866	-1.930 *	3.021 ***
Three or more children	-10.786 ***	-1.378 **	-9.371 ***	-0.360	-7.735 ***	0.218	-5.818 ***	2.207 **
Highest Educational Degree (ref. *Less than HS*)								
HS graduate		2.861 ***		3.390 ***		4.238 ***		5.296 ***
Some college		8.853 ***		9.040 ***		10.047 ***		11.184 ***
College grad and beyond		25.405 ***		22.429 ***		21.667 ***		22.363 ***
Work Status, Cumulative Experience & Training								
Years of Work Experience		0.455 ***		0.336 ***		0.173 ^		-0.017
Years of Work Experience squared		-0.023 *		-0.001		0.002		0.005
% observed in Low-Part-Time jobs (<20 hrs/week)		-1.245 **		-0.321		-2.370 *		-3.029 ^
% observed in High-Part-Time jobs (20-34 hrs/week)		-1.510 **		-1.858 **		-3.128 **		-6.910 ***
Years in Job Training		2.995 ***		1.753 ***		1.962 ***		1.904 ***
Years in Job Training squared		-0.118 ^		-0.088 ***		-0.124 ***		-0.087 *
Sociodemographic Controls								
Age in years	1.163 ***	0.079	0.128 ^	-0.093	0.147 ^	-0.073	-0.199	-0.312 **
Race (non-hispanic white=1; other=0)	2.814 ***	1.838 ***	3.770 ***	2.550 ***	4.733 ***	3.441 ***	5.687 ***	4.463 ***
Marital Status at interview (married=1; other=0)	-0.611 ^	-0.244	-0.668	0.418	-0.581	0.886 *	-1.683 *	-0.344
Husband's income (in thousands of 1990 dollars)	0.078 ***	0.047 ***	0.102 ***	0.015 ^	0.087 ***	0.012 ^	0.089 ***	0.025 **

^p<0.1; *p<0.05; **p<0.01; ***p<0.001

[1] All models include controls for calendar year.

[2] Working women with at least two recorded occupation codes between ages 20 and 54. Results are weighted for attrition, and standard errors corrected for correlation among observations for the same individual.

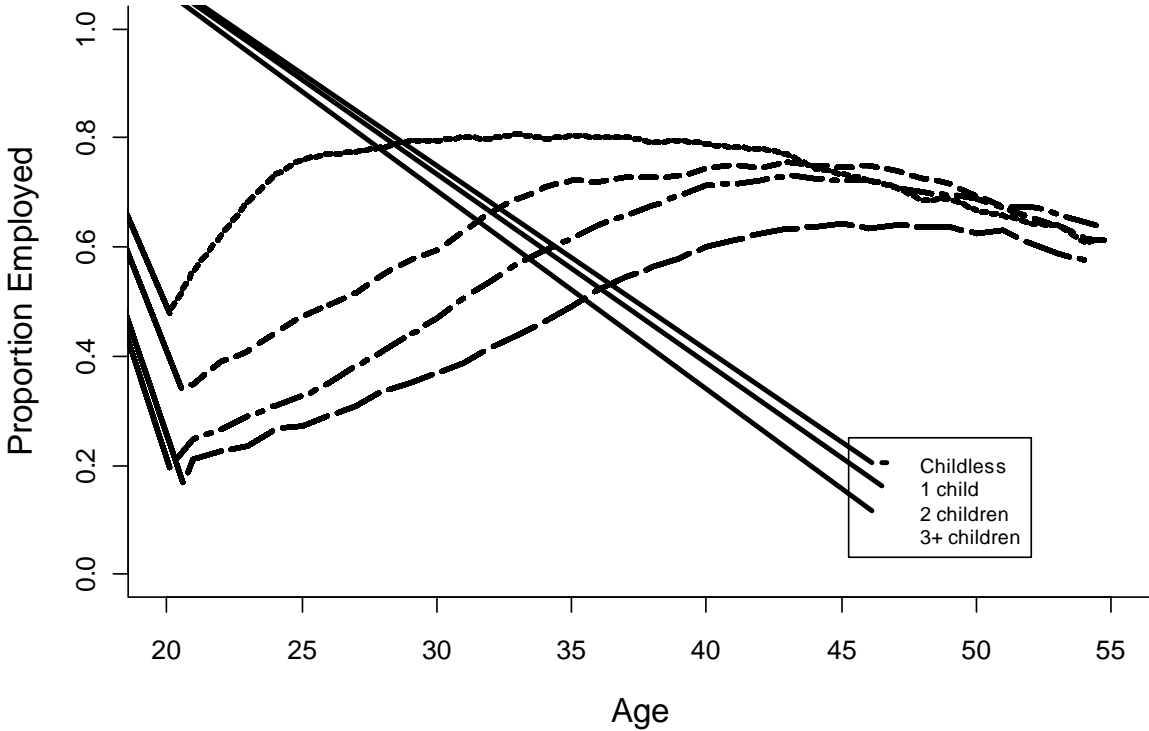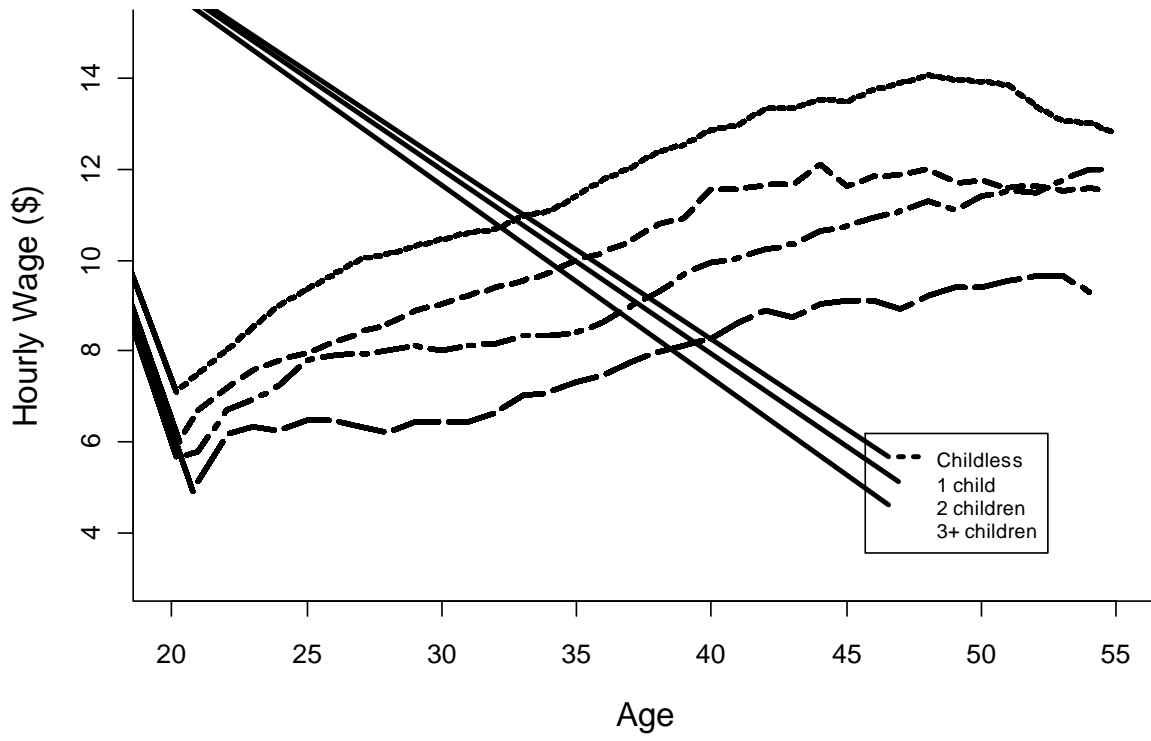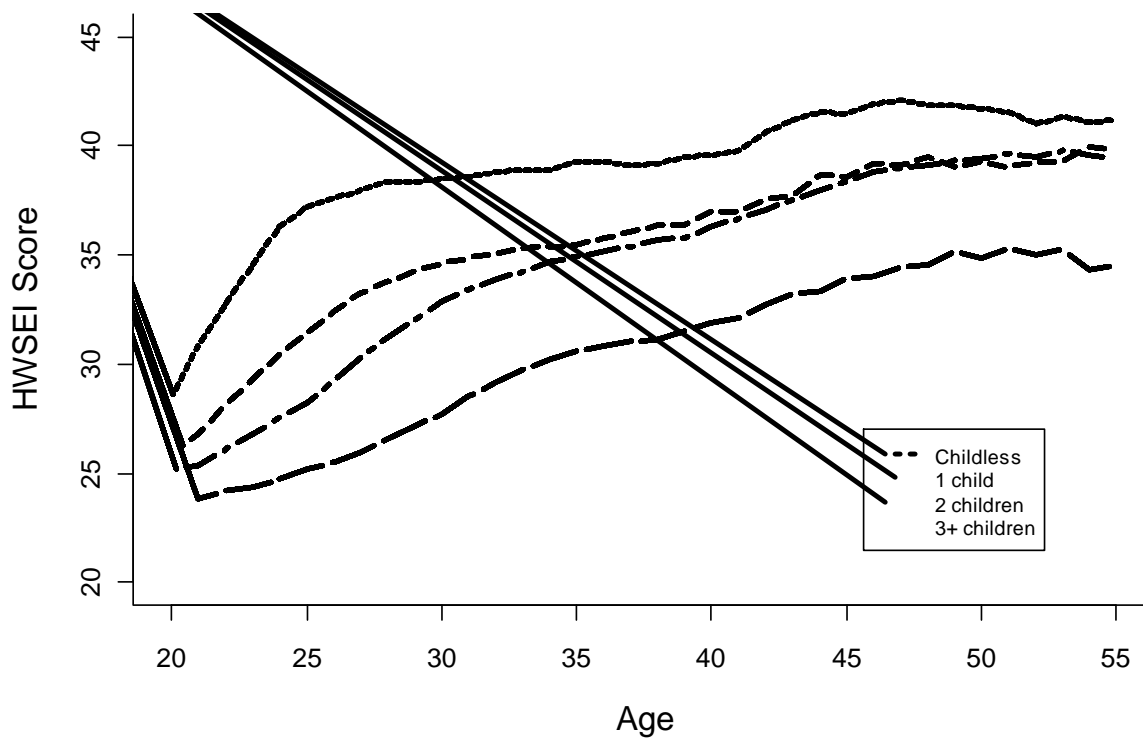**Figure 1: Proportion Employed by Current Fertility (NLS-YW, 1968-2003)**

Figure 2: Wage trajectories by Current Fertility (NLS-YW, 1968-2003)

**Figure 3: HWSEI Occupational Prestige Scores
by Current Fertility (NLS-YW, 1968-2003)**

Childless
1 child
2 children
3+ children

HWSEI Score

Age

Appendix Table 1. Unstandardized Logit Coefficients Predicting Women's Participation in Paid Work: NLS-YW, 1968-2003[1] (pooled).

	Gross Effect	+ Human Capital	+ Age Decade Interaction
N [2] =	4,875	4,741	4,741
Person-year observations =	71,091	66,811	66,811
Children Ever Born (CEB, ref. *Childless*)			
One child	-0.894 ***	-0.906 ***	-0.986 ***
Two children	-1.305 ***	-0.915 ***	-1.134 ***
Three or more children	-1.616 ***	-0.921 ***	-1.227 ***
Highest Educational Degree (ref. *Less than HS*)			
HS graduate		0.492 ***	0.443 ***
Some college		0.309 ***	0.240 ***
College grad and beyond		0.845 ***	0.808 ***
Work Status, Cumulative Experience & Training			
Years of Work Experience		0.386 ***	0.385 ***
Years of Work Experience squared		-0.008 ***	-0.008 ***
% observed in Low-Part-Time jobs (<20 hrs/week)		-1.657 ***	-1.686 ***
% observed in High-Part-Time jobs (20-34 hrs/week)		-0.386 ***	-0.390 ***
Years in Job Training		0.050	0.061 ^
Years in Job Training squared		-0.007 ^	-0.008 ^
Sociodemographic Controls			
Race (non-hispanic white=1; other=0)	-0.138 **	-0.122 **	-0.154 ***
Marital Status at interview (married=1; other=0)	-0.166 ***	-0.302 ***	-0.283 ***
Husband's income (in thousands of 1990 dollars)	-0.002 **	-0.006 ***	-0.006 ***
Age Decade (ref. *Twenties*)			
Thirties	0.192 ***	-0.473 ***	-1.067 ***
Forties	0.263 **	-0.656 ***	-2.026 ***
Fifities	0.133	-0.826 ***	-2.397 ***
Interaction CEB-Age Decade (ref. *Twenties x Childless*[3])			
Thirties x 1 child			0.520 ***
Thirties x 2 children			0.780 ***
Thirties x 3 or more children			0.794 ***
Forties x 1 child			1.107 ***
Forties x 2 children			1.563 ***
Forties x 3 or more children			1.683 ***
Fifties x 1 child			1.185 ***
Fifties x 2 children			1.667 ***
Fifties x 3 or more children			1.859 ***

^p<0.1; *p<0.05; **p<0.01; ***p<0.001

[1] All models include controls for calendar year.

[2] Working women aged 20 to 54 with at least two valid interviews. Results are weighted for attrition, and standard errors corrected for correlation between observations from the same individual.

[3] Switching the reference category for "decade" reveals similar results.

Appendix Table 2. Unstandardized OLS Coefficients Predicting
Working Women's Hourly (ln)Wage: NLS-YW, 1968-2003[1] (pooled).

	Gross Effect		+ Human Capital		+ Age Decade Interaction	
N [2] =	4,602		4,602		4,602	
Person-year observations =	50,084		50,034		50,034	
Children Ever Born (CEB, ref. *Childless*)						
One child	-0.134	***	-0.049	**	-0.058	**
Two children	-0.249	***	-0.074	***	-0.076	**
Three or more children	-0.409	***	-0.118	***	-0.125	***
Highest Educational Degree (ref. *Less than HS*)						
HS graduate			0.262	***	0.261	***
Some college			0.392	***	0.389	***
College grad and beyond			0.657	***	0.656	***
Work Status, Cumulative Experience & Training						
Years of Work Experience			0.051	***	0.050	***
Years of Work Experience squared			-0.001	***	0.000	***
% observed in Low-Part-Time jobs (<20 hrs/week)			-0.092	**	-0.093	**
% observed in High-Part-Time jobs (20-34 hrs/week)			-0.128	***	-0.128	***
Years in Job Training			0.067	***	0.067	***
Years in Job Training squared			-0.005	***	-0.005	***
Sociodemographic Controls						
Race (non-hispanic white=1; other=0)	0.074	***	0.052	**	0.051	**
Marital Status at interview (married=1; other=0)	-0.089	***	-0.067	***	-0.066	***
Husband's income (in thousands of 1990 dollars)	0.006	***	0.004	***	0.004	***
Age Decade (ref. *Twenties*)						
Thirties	0.048	**	-0.106	***	-0.104	***
Forties	0.038		-0.208	***	-0.249	***
Fifities	-0.012		-0.323	***	-0.472	***
Interaction CEB-Age Decade (ref. *Twenties x Childless*[3])						
Thirties x 1 child					0.036	
Thirties x 2 children					-0.016	
Thirties x 3 or more children					-0.012	
Forties x 1 child					0.047	
Forties x 2 children					0.039	
Forties x 3 or more children					0.058	
Fifties x 1 child					0.094	
Fifties x 2 children					0.198	**
Fifties x 3 or more children					0.168	**

^p<0.1; *p<0.05; **p<0.01; ***p<0.001

[1] All models include controls for calendar year.

[2] Working women aged 20 to 54 with at least two valid interviews. Results are weighted for attrition, and standard errors corrected for correlation between observations from the same individual.

[3] Switching the reference category for "decade" reveals similar results.

	Gross Effect	+ Human Capital	+ Age Decade Interaction
N [2] =	4,796	4,721	4,721
Person-year observations =	66,305	63,818	63,818
Children Ever Born (CEB, ref. *Childless*)			
One child	-4.220 ***	-0.491 *	-0.653 *
Two children	-6.018 ***	-0.258	-0.853 **
Three or more children	-8.801 ***	-0.851 ***	-1.379 ***
Highest Educational Degree (ref. *Less than HS*)			
HS graduate		3.313 ***	3.204 ***
Some college		9.198 ***	9.048 ***
College grad and beyond		24.042 ***	23.977 ***
Work Status, Cumulative Experience & Training			
Years of Work Experience		0.285 ***	0.278 ***
Years of Work Experience squared		-0.002	-0.001
% observed in Low-Part-Time jobs (<20 hrs/week)		-1.372 **	-1.384 **
% observed in High-Part-Time jobs (20-34 hrs/week)		-1.775 ***	-1.776 ***
Years in Job Training		2.278 ***	2.299 ***
Years in Job Training squared		-0.129 ***	-0.131 ***
Sociodemographic Controls			
Race (non-hispanic white=1; other=0)	3.487 ***	2.260 ***	2.206 ***
Marital Status at interview (married=1; other=0)	-0.561 *	0.171	0.210
Husband's income (in thousands of 1990 dollars)	0.101 ***	0.026 ***	0.025 ***
Age Decade (ref. *Twenties*)			
Thirties	1.598 ***	-0.193	-1.181 **
Forties	1.924 **	-0.602	-2.526 ***
Fifities	-0.561 *	-1.409 *	-4.928 ***
Interaction CEB-Age Decade (ref. *Twenties x Childless*[3])			
Thirties x 1 child			0.675
Thirties x 2 children			1.694 ***
Thirties x 3 or more children			1.275 **
Forties x 1 child			1.706 *
Forties x 2 children			2.439 ***
Forties x 3 or more children			2.366 ***
Fifties x 1 child			3.028 **
Fifties x 2 children			4.225 ***
Fifties x 3 or more children			3.974 ***

^p<0.1; *p<0.05; **p<0.01; ***p<0.001

[1] All models include controls for calendar year.

[2] Working women aged 20 to 54 with at least two valid interviews. Results are weighted for attrition, and standard errors corrected for correlation between observations from the same individual.

[3] Switching the reference category for "decade" reveals similar results.