# Labor Force Attachment and the Evolving Wage Gap between White, Black and Hispanic Young Women

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## Abstract

We analyze the role of labor force attachment in shaping the diverging wage trajectories of white, black and Hispanic women during their first post-schooling decade. We take advantage of the longitudinal aspects of the NLSY Work History data by constructing detailed annual and cumulative measures of labor force attachment and use it to examine women's wage profiles. We find constant race and ethnic wage gaps among women with some college education and a widening race gap among women with no college education. The latter pattern emphasizes the importance of market-related processes in generating wage inequality among unskilled women. We document substantial race and ethnic gaps within this group in the accumulation of labor force attachment, especially right after the transition from school-to-work. The initial gaps in market attachment are so large that minority women can never catch up with their white counterparts. This deficit in labor market experience plays a critical role in creating the diverse wage trajectories of white, black and Hispanic women with no college education.

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## Introduction

Recent indicators reveal appreciable wage disparities between minority and white women (Neal, 2004; U.S. Census Bureau, 2004; Altonji and Blank, 1999; Blau, 1998; Bound and Dresser, 1998; Browne, 1998). There is general consensus that large racial and ethnic disparities in educational attainment during a period of rising returns to skills are primarily responsible for increased wage disparities among women (Bound and Dresser, 1999; Blau and Kahn, 1997; Anderson and Shapiro, 1996). However, even when compared to whites with similar levels of education, minorities earn less than do whites (Holzer, 2000). Recent national data confirm that white women without a college diploma (i.e. high school dropouts, high school graduates and those with some college education) out earn their black and Hispanic educational counterparts, while black women with bachelor's degree earn more than their white and Hispanic counterparts (U.S. Census Bureau, 2004).

Interestingly, among the least educated women, where the race and ethnic wage gaps are considerable, there are also differences in employment rate. The employment rate for white high school dropouts in their most crucial stage of the transition from school to work, namely at the ages of 16-19, is 33 percent, as compared with 15 and 20 percent for black and Hispanic high school dropouts respectively. Similarly, the respective employment ratios for white, black, and Hispanic high school graduates at the age of 18-24 are 61, 52, and 55 percent. Differences along the same racial and ethnic lines are also found among women with some college education. The only exception is the group of highly educated women. The employment rate of black college graduates at the age of 25-34 is more than 86 percent, as compared with 82 and less than 77 percent

among whites and Hispanics respectively. Taken together, minority women's disadvantage in both earnings and employment prospects motivates our focus on the link between women's labor force attachment and future earnings. By so doing, we hope to better understand the race and ethnic wage gaps, especially among women with low level of schooling.

Although group differences in the accumulation of labor force attachment seems to be a promising direction for accounting for the diverging wage trajectories of majority and minority women, there is very little research aimed at examining it. One of the reasons for this lacuna is the fact that women's employment histories are more complex and diverse than men's, hence more difficult to portray (Hseuh and Tienda 1996; Klerman and Karoly 1995; Light and Ureta, 1995; Moen and Smith 1986). The main difficulty is the construction of accurate measures of women's actual labor force attachment. Such measures require a panel that follows individuals over time from the point of their transition from school into the labor market. Since most studies use cross-sectional data, researchers frequently use a measure of potential experience rather than actual work history. However, it has long been agreed that potential experience, or the cumulative number of years of labor force participation where longitudinal data are available, systematically overstate labor force attachment of women because of their labor force instability (Anthecol & Bedard 2004; Taniguchi and Rosenfeld, 2002; Bound and Dresser, 1999; Light and Ureta, 1995). Furthermore, these proxies of labor market attachment are especially poor measures for minority women, a group that typically demonstrates high levels of labor market instability. Since such crude measures of

experience plausibly underestimate race and ethnic differences in labor force attachment, biased estimates of race and ethnic wage gaps are derived when using them.

On average, most lifetime wage growth occurs during the first ten years in the labor market (Bernhardt et. al. 2001; Topel and Ward, 1992). To better understand how labor market inequality is generated, we focus on this formative period during which trajectories of upward mobility are set. Specifically, we analyze the role of labor force attachment in shaping the diverging wage trajectories of white, black and Hispanic women during their first post-schooling decades. We take advantage of the longitudinal aspects of the NLSY Work History data by constructing detailed annual and cumulative measures of labor force attachment and use this work history records to examine women's wage profiles.

**Background**

One of the most striking changes in the social landscape over the past several decades is the rapid rise in female labor force participation. This trend is driven simultaneously by an increase in the proportion of women working at any given point in time and a decrease in the propensity of working women to withdraw from the labor force when they become mothers (Blau and Kahn, 2005). Not only are women now more likely to obtain employment than in the past, they are also more likely to extend the length of their work spells. Nevertheless, labor force instability remains a defining feature of women's work. Traditionally the providers of non-market labor within the household, women have retained primary responsibility for the domestic arena even as their labor market attachment has increased (Blair and Lichter 1991; Robinson 1988;

Baruch et al. 1987). Despite women's rising commitment to the work force, it remains socially acceptable for women to choose endeavors that interfere with paid work. Whether the context and conditions of female employment result from free or constrained choices, women's average attachment to the labor market, usually measured by the amount of time spent at work, remains weaker than men's (Light and Ureta 1995; Wenk and Rosenfeld 1992; Hakim 1991).

However, women's market attachment is age-patterned, whereas most instability is confined to younger ages (Klerman and Karoly, 1995). Alon et. al. (2001) depict a decline in labor force instability and an increase commitment to the labor market as young women mature. They show that the share of unstably active women declines from 63 percent at the age of 18 to 32 percent at the age of 28, while the share of stably active women rises from 17 to 50 percent during the same time frame. What is more, Klerman and Karoly (1995) find that the transition to stable employment varies by the level of educational attainment. Specifically, high school dropout women make the transition to stable employment more slowly than the more educated women. While patterns of early career found for college educated or those with some college education are similar to those found for men, differences between the experiences of women and men are large among high school dropouts and high school graduates.

These education-based disparities in the transition to stable employment, at time of rising returns to education and skills, underline the merit in investigating the long-term consequences of early labor market behavior on future earnings (Hotz et al. 1999; Keane and Wolpin 1997; Topel and Ward 1992; Ellwood 1982; Becker and Hills 1983, 1980; Meyer and Wise 1982). There are compelling theoretical reasons why early attachment

should influence future wage prospects. Human capital theory stresses the benefits of work experience and job-specific training for creating labor market skills that raise future productivity (Becker, 1993). Early periods of non-employment lower the stock of accumulated work experience and lead to the deterioration of skills and human assets. In addition, employers may prefer not to invest in training of unstable women. Since labor force attachment enhances human capital acquisitions, it becomes an important factor in shaping wage trajectories (Alon and Tienda, 2005; Tomaskovic-Devey et. al., 2005; Tienda and Stier, 1996; Hsueh and Tienda, 1995). This is particularly true for individuals who lack formal education, because accumulated experience represents human capital acquisition that boosts worker's productivity.

Experience is important for unskilled individuals also because it signals commitment to the workforce. From a signaling theory perspective (Spence, 2002; 1973), instability and long spells of labor force idleness not only convey to current and/or future employers about the individual's underlying level of productivity but also are taken as a signal for unobserved attributes (e.g., motivation, loyalty, commitment). Since employers' beliefs and expectations about the individual's "taste" for paid work determine wage offers, a history of long and repeated spells out of the labor force is expected to produce lower wage offers along the way. These wage returns determine, in turn, the investment decisions that individuals make with respect to future labor force attachment. Thus, as Spence (2001) noted, this is a self-confirming process, a complete circle in which early attachment levels are interpreted by employers as signals for employees' commitment and productivity and are used to determine earnings. In turn, wage returns shape employees' future labor force attachment.

This self-confirming nature of the process magnifies the importance of women's early years in the labor market - right after they leave school. Early labor force attachment enhances women' human capital, either by contributing directly to productivity or by signaling important attributes to future employers. This is why it is crucial for launching labor market careers and shaping life-time earnings. Hence, low levels of attachment early in the career can have detrimental and long lasting effects even if these levels rise over time. Both human capital and signaling perspectives suggest that market experience may be especially important in shaping wage trajectories for the less-educated, a group with high concentration of minorities.

Early experience may play a critical role in explaining the diverse wage trajectories of white, black and Hispanic women because of racial and ethnic differences in the accumulation of labor force attachment (Taniguchi and Rosenfeld, 2002; Alon et. al., 2001; Bound and Dresser, 1999; Corcoran, 1999; Hsueh and Tienda, 1996; Tienda and Stier, 1996). Taniguchi and Rosenfeld (2002) report that black and Hispanic women not only exit the labor force more quickly than white women but also worked for shorter spells before exiting. Similarly, Alon et. al., (2001) find that white women were more likely than minority women to be stably active in the labor force between ages 25-28. Tienda and Stier (1996) who investigated inner-city parents report that 9 percent of white mothers had no prior work experience compared to 17 percent of Mexican, 20 percent of Black and 29 percent of Puerto Rican mothers.

These between-group differences in the levels of labor force attachment should be translated into wage differentials between the same groups. The self-confirming nature of this process implies that early low level of labor force attachment can exacerbate initial

race and ethnic differences in wages. Put differently, black and Hispanic women's deficits in market experience should turn into over-time *rising* wage differentials between them and whites. Empirical evidence documenting this link is scarce. McCrate and Leete (1994) find that one major factor that contributed to the rising race wage gap among women between 1977 and 1986 is the growing gap in work experience. Similarly, Bound and Dresser (1999) find that the declining relative (potential) experience of black women contributed to the erosion of black women relative wages.

The divergence in black-white female earnings over the past 20 years - after several decades in which black women's economic fortunes had improved greatly relative to whites' provides the substantive importance for our study (Neal, 2004; U.S. Census Bureau, 2004; Altonji and Blank 1999; Bound and Dresser 1999; Corcoran 1999; Blau, 1998; Browne, 1998). Since the combination of the widening gap in educational attainment and the rising value of education explain only about 10 percent of the widening earning gap between young black and white women (Bound and Dresser 1999), we divert attention from pre-market explanations to the role of labor market processes in exacerbating or attenuating the race and ethnic wage gaps.

**Data**

*Sample*: We analyze the National Longitudinal Survey of Youth (NLSY), a national probability sample of 12,686 individuals ages 14-21 as of January 1, 1979, who were re-interviewed annually until 1994. We restricted our sample to women, and excluded the nonrandom military and poverty samples.[1] Like Neal and Johnson (1996) and Carneiro, Heckman and Masterov (2005) we analyze respondents born after 1961

and were at the ages of 14-17 in 1979. This group had neither worked full time in the labor market nor started postsecondary schooling when we first observed them.[2] The analysis is therefore restricted to the younger subset of the NLSY panel, which provides the least contaminated estimates of residual wage gaps (Neal and Johnson, 1996). All these restrictions yield a sample of 1780 women - 847 whites, 568 blacks and 365 Hispanics.

*Data construction*: The NLSY Work History file reports weekly employment status for each respondent. For each month we constructed a measure indicating whether the respondent was employed. A woman's main job was derived by identifying the job in which she worked most of her monthly hours (in case of dual job holding). We used this information to construct a monthly and an annual history of primary employment status. The fact that respondents average 200 person-months in their entire work history records enables precise tracking of *all* employment events between the ages of 14 and 30. 336,960 person months were used to derive annual measures of labor market behaviors and outcomes.

We arranged the data by post schooling years and not by age. This is important because group differences in educational attainment generate group-based divergence in the timing of market entry. Thus, aged-specific analysis is misleading because it compares workers with different levels of education and different level of accumulated experience. For example, at any given age, high school dropouts can potentially acquire higher level of labor force attachment than college educated women. These differences are especially pronounced at younger ages when some women are still enrolled in school. Furthermore, a spell out of

the labor force has a totally different consequence for wage prospects if spent in acquiring college education or spent at home. Therefore, we compare women belonging to different racial and ethnic groups with similar levels of educational attainment. Finally, to avoid conflating instability with temporary student's employment, we measure the accumulation of labor force attachment in post-schooling years only.

However, the sample structure, depicted in Table 1, limits the time span in which we can follow these women. The main limitation is the extent to which we can track the careers of women who acquired a college education and entered the labor force in their mid-20s. Table 1 show that we have only 9 years record of labor force experience for college graduates. This right censoring not only means a declining number of person-months but also distorts the balance of the sample in terms of educational attainment and race/ethnicity. However, for women who did not pursue college education we can use a longer time frame. Therefore, we limit some analyses to the first nine post-schooling years. However, when depicting the work history of women with not more than high school education we broaden the post-schooling interval to fourteen years.

We classify each respondent into one out of four education categories indicating the highest level completed by age 30 (High School Dropout; High School Graduate; Some College, and College Graduate). After extensive diagnostic analyses we use the middle point age for graduation in a given schooling category (17, 18, 20, and 23, respectively) as the starting working age for each individual within categories. Thus, for high school dropout the counting of post-schooling years starts at the age of 17; for high

school graduates $t_1$ is at the age of 18; the respective ages for women with some college education and college graduates are 20 and 23.

We use these age benchmarks for women at a given schooling category and not their actual age at school departure because of unreliable enrollment data, including missing data problems and illogical trajectories. As noted by Klerman and Karoly (1995), the heterogeneity and complexity of transitions between school, work and leisure make the operationalization of the concept of 'school departure' difficult. Our school-to-work framework could be biased if across-race differences in the timing of school departure are present. Hotz and Tienda (1998) show that after ability differences are taken into account there are no ethnic differences in school departure among women and slightly slower pace for blacks. However, a definitive conclusion based on this evidence is impossible to make because of group differences in educational attainment. We further discuss this possibility and its implications when presenting the results.

*Variables*: Building on the rich information provided by this longitudinal survey (NLSY) we derive a measure of *actual labor force attachment* (LFA) for each woman. It is the percent of time spent annually in paid employment: the number of employed months in each year divided by 12 (times 100). We also constructed a cumulative measure of LFA for the time intervals analyzed, i.e. $t_1 – t_9$ or $t_1$ - $t_{14,}$ by summing up all these annual percents and dividing the cumulative measure by the number of years included in the post-schooling interval. These variables (ranging from 0-100) capture the fraction of time spent in the labor market. We find that, on average, women devoted

about 64 percent of their time between $t_1$ and $t_9$ to paid employment, the median is 73 percent and the inter-quartile range is between 39 to 92 percent.[3]

To compute *hourly wages* in a certain year, we summed nominal hourly wages for all person-months in that year and divided it by the number of non-missing months with wage information. This approach yields average annual hourly wages for each post-school year. All wages reported are real wages expressed in 1995 prices. The wage analyses were restricted to women with valid earnings information for the ninth year after leaving school ($t_9$) or, for women without a college education, the fourteenth year after leaving school ($t_{14}$).

We controlled for two variables indicating family responsibility: *marital status* and *number of children* at respective years. In the pooled models we also controlled for formal credentials by including indicators for *highest education level completed* (high school dropout is the omitted category). In some models we added measures of respondents' family background at the time of the first interview: *parents' income* and an indicator for *maternal employment*. We also used respondents' score on the Armed Forces Qualifying Test (*AFQT*).[4] AFQT may measure productive abilities but also the respondent's socioeconomic background and social environment (Fischer et. al., 1996). Since the performance of test-takers is contaminated by schooling attainment at the date of the test, we adjusted the AFQT scores for age.[5] Finally, we controlled for the average *unemployment* rate in the local labor markets within which the women reside in all post-schooling years; her real *starting (ln) wage rate* (wage rate in the first post-schooling year or, if not employed at $t_1$, her wage rate in the second year); and a flag indicating whether

she was missing a wage observation (*not employed*) in both years. Appendix A provides detailed definitions of all variables and their descriptive statistics.

## Results

### Wage Trajectories

We start by depicting young women's diverging wage trajectories in the first post-schooling years. Figure 1a depicts women's hourly wages (in 1995 prices) between $t_1$ and $t_9$, by race and ethnic category. The data reveal that black and Hispanic women's starting wages lag behind those of white women (annual averages of hourly wage rates of \$6.9, \$7.3 and \$8.1, respectively). Above and beyond differences in starting wages, gaps in women's wages at subsequent years widen. Nine years after school leaving black women wage rate reaches \$9.01, while that of Hispanics and whites rise to \$10.7 and \$11.8, respectively. Thus, black women' wages grew in about \$2.1 in the nine-year interval after leaving school compared to \$3.4 among Hispanic women and \$3.7 among white women. This result concurs with Oettinger's (1996) findings of a widening wage gap among men as they accumulate labor-market experience.

[Figure 1 about here]

Since these group disparities in wage trajectories may capture race and ethnic-based differentials in investment in education, we divide the sample into two skill levels: those who did not pursue college education (high school graduates or high school dropouts referred to as "unskilled") to which we can track their work history for 14 years; and those who have some kind of college experience (women with some college education or college graduates which we dubbed as "skilled") followed for a time interval

of nine post-schooling years. Figure 1b depicts the wage trajectories of black, Hispanic and white skilled women. Evident from this figure is that in every post-college year there are race and ethnic wage differentials. However, the gaps in starting wages are not widening much over time. This suggests that labor market processes do not *accentuate* pre-market differences among women who pursue college education.

The wage trajectories of unskilled women, captured in Figure 1c, reveal that the diverging wage trajectories depicted in Figure 1a are mostly the result of the experience of this group of workers. At any post-schooling year, from $t_1$ to $t_{14}$, unskilled black women earn less than either Hispanic or white women with similar level of educational attainment. Furthermore, the race gap is widening over time. At the first post-schooling year the differences in hourly wage rate are trivial ($6.3, $6.7 and $6.4 earned by black, Hispanic and white women). At the ninth post-schooling year black women' hourly wage rate is $7.2 compared to $8.9 and $9.1 earned by their Hispanic and white educational counterparts. By the fourteenth year in the labor market, black women wage rate reaches $7.5 indicating an almost stagnation in their earnings growth, while that of Hispanic and white women continue to rise, reaching $9.3 and $10, respectively. It appears that experiences accumulated *inside* the labor market shape the race wage gap for women with low level of human capital.

In sum, the findings suggest that the race gap among skilled women is related to, although not limited to, pre-market characteristics, while market-related processes may be more important in shaping the wage trajectories of unskilled women. This motivates an examination of women' labor force attachment of young women starting from the school-to-work transition, which is what we do next. Subsequently, we examine the

importance of accumulated labor force attachment to earning prospects and whether different profiles of market activity may account for the widening race wage gap among unskilled women.

**Labor Force Attachment**

With these disparate wage trajectories we now assess how attached were white, black and Hispanic women to market activity during the same post-schooling interval. To portray the variation in women' attachment and its timing we report the annual incidence of employment, and, given employment, the fraction of time devoted to market activity each year. Table 2a depicts these measures for all women by post-schooling year. The data regarding the annual incidence of employment suggest that in any given year during the nine-years post-schooling interval, minority women lag behind white women. The gaps are especially pronounced at the early years, right after the school-to-work transition, and narrow in later years. Despite a gradual decline in white women's employment rates, black and Hispanic women do not reach white women' levels There is also considerable diversity along race and ethnic line in the percent of months during which they were employed each year. In any given year, white women worked a higher fraction of their time than minority women, although the gaps are shrinking with time. Taken together, our findings clearly demonstrate that, using Klerman and Karoly's (1995) notion, the transition to stable employment is slower among young minority women than it is among whites.

[Table 2 About Here]

Since prior research suggests that the transition to stable employment varies by the level of educational attainment, we replicate the analysis in Table 2b by skill level. Among skilled women we find small group differences, favoring whites, on both measures of labor force attachment. However, there are striking race and ethnic difference in labor force attachment and the accumulation of work experience among women with lower levels of education. In any given year minority women lag behind their white counterparts in employment rates. The initial gaps are so large that, even though there is a temporal increase in minority women' employment rate and a decline in whites', minority women never catch up with their white counterparts. Interestingly, minority women's employment rate at the 14$^{th}$ post-schooling year (67 percent) is substantially smaller than the employment rate of white women in the *first* year (85 percent). Moreover, among participants, white women spent a larger fraction of every year in market activity.

These findings highlight the importance of the timing of labor market entry for understanding group-based wage differences. To further appreciate this aspect of the school-to-work transition we examine the timing of the first post-schooling job. Overall, as the data in Table 3 suggest, more than 90 percent of skilled women experience a smooth transition and start their first job immediately after schooling. Minority women transition is slower than that of whites with similar skills as only 84 and 87 percent of black and Hispanic women, respectively, held a job in the first year compared to 95 of white skilled women. However, the differences among unskilled women outshine those among the skilled: less than half of black women held a job in the first post-schooling year compared to 70 percent and 85 percent among white and Hispanic women,

respectively. By the forth year only 80 percent of black unskilled women worked at least once (91 and 95 percent for Hispanic and whites respectively) and 8 percent of them never engaged in paid employment by the ninth post-schooling year.

[Table 3 About Here]

This pattern of delayed entry to the labor market implies that among equally educated, same-age women, minority women accumulate work experience deficit compare to whites. Late entrants compete on jobs with other women who although have the same level of formal education, have already accumulated valuable work experience and possibly gained new skills through job training. Whether it is because of low wage offers, high reservation wages, restricted opportunities, discrimination, reliance on welfare, family reasons and/or low level of work commitment - late entrants, which minority women are the bulk among them, lag behind their experienced counterparts in the acquisition of on-the-job human capital. These accumulated large work experience deficits are apparent to employers Signaling theory suggests that their beliefs and expectations of women's "taste" for employment are based on data derived from the market, and that they use it when recruiting employees, offering them on-the-job training and setting their wages.

This process is self-confirming, where initial low level of labor force attachment reproduces itself, making it increasingly harder for low-attachment women to find employment, get training and experience wage growth. Although initial wages can shape future labor force attachment, our findings suggest that among minority unskilled women, low levels of attachment precede the first wage observations. That said, low wage offers, restricted employment opportunities, and/or discrimination, may play a role

in keeping minority women out of the labor force, instigating this self-confirming process that eventually reproduces inequality.

Given these remarkable group differences that are much larger than any reasonable delayed or early school departure could result, it is clear that minority women's lower level of labor force attachment is not an artifact derived from the cutoff age we use to construct the post-schooling interval. Moreover, the complexity of women' employment, depicted herein, render several common analytical strategy inadequate. First, annual measures of employment overstate women' labor force attachment by failing to capture their volatility. On average, women in our sample participated in paid employment for 7.3 years within the nine-year time interval. More than half of the women worked in all nine years with additional 13 percent who worked for 8 years. Only a small fraction (less than 3 percent) never worked within this time interval. This annual measure of employment indicates a relatively high level of attachment. However, it is misleading, because of the intermittent nature of women' participation. Our measure of monthly-based labor force attachment is superior because it characterizes women's participation more accurately, regardless how sporadic it has been. Second, depicting women' work history starting from the first employment spell, as is done in several studies, may produce biased results because it ignores deficits in labor force attachment during the transition from school to work. Lastly, analyses of women' labor force exit behavior fail to capture differences in the school-to-work transition because women who do not work are left out of the risk set. Thus, reports about racial and ethnic differences in labor force exits (e.g. Taniguchi and Rosenfeld, 2002) probably underestimate disparities in labor force attachment.

To better understand this considerable diversity in labor force attachment, we estimated several OLS models of LFA in the first nine post-schooling years, for low and high skill women.[6] We examined three models for each skill group. The first includes a series of group indicators, serving as a baseline for the gaps in LFA. The second model adds several individual and family characteristics: whether graduated from high school (unskilled) or college (skilled); family responsibility (number of children born up to $t_9$ and marital status at $t_1$); two measures of family background (respondent's parents' income at the time of the 1979 interview and an indicator for mother employment); and AFQT score. Model 3 adds several covariates that can point to the impact of labor market structure in shaping women' attachment: the average unemployment rate in the local labor markets within which the women reside in all post-schooling years; woman's starting (ln) real wage rate (wage rates paid to her in the first post-schooling year or, if not employed at $t_1$, her wage rate in the second year); and a flag indicating whether she was missing a wage observation (not employed) in both year. Table 4 presents the results by skill level (Models 1-3 for skilled women, models 4-6 for unskilled women).

[Table 4 About Here]

Among skilled women (model 1), racial and ethnic differences are small: blacks and Hispanics accumulated 5 and 7 percent respectively less time in the labor market during the $t_1$ - $t_9$ interval in comparison to white skilled women. These small gaps disappear when background variables are controlled for in model 2. A college diploma increases the fraction of time employed by about 8 percent while each child reduces it by about 10 percent.[7] The only family background variable that influences the pattern of career formation is parents' income. Model 3 controls for labor market conditions and

starting wage rate. We find that local unemployment rates had no statistically significant influence on skilled women accumulation of market experience. The results also demonstrate some elasticity of women' labor force attachment to starting wages: a one ln unit increase in starting wages around the women's mean wage rate (i.e. from one half of a unit below the mean to one half of a unit above the mean – roughly translated into $7) is associated with more than 6 percent increase in LFA. Moreover, a flag capturing the 5 percent of skilled women with no wages in either $t_1$ or $t_2$ is negatively associated with LFA, indicating that their labor force idleness became chronic (at least until the end of the interval).

Model 4 suggests that the racial and ethnic gaps among unskilled women in the accumulation of LFA in the early stage of career formation are larger than those found among their skilled counterparts: blacks and Hispanic accumulated 26 and 17 percent, respectively less LFA than whites. Given these large disparities, it is interesting to examine the portion of these gaps that can be accounted for by adding controls to equation 4. Overall, all individual and family characteristics included in model 5 explain a substantial share of the variation in LFA ($R^2 = 0.43$). The results suggest that the race and ethnic gaps shrink, although a race gap of about 8 percent still persists even after controlling for other attachment-shaping characteristics.

High school diploma increases the fraction of time employed by about 13 percent. This may result from a better employment opportunity structure available for high school graduates and/or from employers' preferences for hiring and training high school graduates. Childbearing has a similar impact on the accumulation of LFA to that found for skilled women. Replicating this analysis by race and ethnic groups shows that high

school credential and childbearing are more important for white women's LFA than for minorities (results not shown). Thus, although income received from child support or transfer payments for single mothers may represent either negative incentives for employment, or reluctance to report informal employment (Edin and Lein, 1997), we find that the presence of children cannot account for minorities' experience deficits. Family background, which had almost no effect on skilled women, stands out as an important factor shaping the likelihood and intensity of unskilled women's employment. Parents' income, maternal employment and AFQT scores are positively and strongly associated with increased levels of LFA.[8] These results highlight the long lasting effect of childhood social environment and poverty on adults' labor market behaviors.

The results (model 6) also point to the importance of labor market opportunities in shaping unskilled women' employment prospects (Alon, 2004; Taniguchi and Rosenfeld, 2002; Lichter and Landry, 1991). Concentration in local labor markets that offer limited employment opportunities (high unemployment rate) further constrain unskilled women's accumulation of work experience. Group-specific models show that this effect was especially strong for minorities. This supports findings that individuals with lower educational levels, as well as nonwhites and low-skilled women, experience greater cyclical employment fluctuation than their counterparts (Hoynes 1999). What is more, the wage rate women are able to secure upon career launching further shapes their LFA. Everything else equal, one unit growth in starting wages boosts unskilled women attachment in 10 percent. That the flag for $t_1$-$t_2$ nonparticipation (23 percent of the unskilled women) is statistically insignificant indicates that, as opposed to skilled women, unskilled women withdrawal from the market is temporary, and as shown in

Tables 2 and 3, these women (within which minority women are exceptionally overrepresented) do enter the market at a later stage in their career.

**Labor Force Attachment and Wages**

Given these disparities in the formation of early careers, the objectives of the wage analysis are to assess: (1) whether and how accumulated LFA shapes women's future earnings; (2) whether the diverse profiles of LFA, especially among the unskilled, can account for the widening wage gap between white, black and Hispanic women; and (3) whether there are group differences in the wage returns to LFA. To get a purchase regarding the importance of a detailed work history for wage determination we estimate a (ln) wage model at $t_9$ with different specifications of labor force attachment. The results are depicted in Table 5. The first model controls for the fraction of time spent in employment at $t_9$; the second model replaces this measure with the cumulative number of years of employment; the third model introduces our detailed measure of LFA: percent of time employed in the $t_1$-$t_9$ interval (we centered this variable to avoid multicolinearity problems); and in the forth model we relax the constraint of a linear impact of LFA on wages and add a squared term of the cumulative LFA. The fifth model adds several background controls. Clearly, a specification that considers women' accumulated LFA (model 3) explains a greater variance in $t_9$ wages compared to the less detailed specifications of models 1 and 2. Overall, a quarter of $t_9$ wage variance is accounted for by the accumulation of work experience. Moreover, the squared term is positive and significant (Model 4) suggesting a nonlinear relationship between LFA and wages. These relationships hold even after controlling for other wage-shaping characteristics.

[Table 5 About Here]

With this in mind we now turn our focus to the second objective of this section by examining whether the considerable race and ethnic diversity in the accumulation of LFA accounts for the widening wage gap between white, black and Hispanic women. We estimate (ln) wage model at $T_9$ (also at $T_{14}$ for unskilled women) separately for skilled and unskilled women. The first model includes group dummies, and it serves as a baseline for the between-group wage gaps. The second model adds the cumulative LFA in the respective period, $t_1$-$t_9$ or $t_1$-$t_{14}$ (centered), and its squared term. The third model adds controls for high school or college diploma; number of children ever born; marital status; and AFQT.

The results of the baseline model for skilled women, presented in Table 6, indicate a race wage gap at $t_9$ of about 24 percent and a small (five percent) gap between white and Hispanic women that does not reach statistical significance. Inclusion of the labor attachment variable and its squared term (model 2) significantly improves the explained variance of $t_9$ wages (the incremental F is found to be statistically significant [$F(2, 670) = 40.82$; $p < 0.000$]) and reduces the race wage differentials among skilled women to about 18 percent. Each percent of accumulated LFA—that translates into, approximately, one month of employment—increases $t_9$ (ln) hourly wage in about 1 percent.[9] That the squared term is not significant indicates that the effect of LFA on $t_9$ wages is linear. Among skilled women, the race gap further shrinks and becomes statistically insignificant when other controls are added (model 3) – noteworthy are college diploma and the number of children born. In addition, the Hispanic coefficient becomes significantly different from zero.

[Table 6 About Here]

Among unskilled women we find baseline race and ethnic wage gaps that are similar to those reported for their skilled counterparts: a race wage gap at $t_9$ of about 22 percent and a five percent gap, not statistically different from zero, between white and Hispanic women (model 4). However, as suggested by figure 1, the race wage gap has evolved over time among the unskilled, pointing at the role of market-related processes in structuring wage trajectories. It is therefore not surprising that controlling for cumulative labor force attachment between $t_1$ and $t_9$ (and its squared term) entirely explains the race wage gap among the unskilled (model 5). In other words, the growing wage differential between the unskilled blacks and whites are mostly related to the blacks' alarmingly low level of market attachment.[10]

For unskilled women, each additional percent of accumulated LFA increases $t_9$ (ln) hourly wages in about 1 percent, similar to the rate we find for skilled women. That the squared term is positive and significant suggests that the effect of LFA on unskilled women' wages gets steeper as levels of LFA rise. To illustrate, an increase in LFA from 80 to 90 percent (translates to additional 11 months of employment or roughly one year in the 9-year interval) is associated with 0.185 log points wage gain while a similar 10 percentage points increase in LFA from 30 to 40 percent results in only 0.135 log points of wage gain (calculation based on model 5 point estimates). The inclusion of the other variables (model 6) does not add much to the explanatory power of the model (only AFQT is significant) and does not alter the effect of the LFA variables. However, when taking into account labor supply and other productivity-enhancing characteristics, unskilled Hispanic women earn, on average, more than whites. This indicates that there

are some unobserved characteristics of unskilled and skilled (model 3) Hispanic women that help them to surpass white women of equal measured characteristics.

Since we can track the work history of unskilled women for a longer period of time, we also assess the influence of the accumulation of LFA on $t_{14}$ wages. The results parallel those for the 9th-year wages, although some differences are noteworthy. First the race wage gap in the 14th year is reduced by about 14 percent after the inclusion of the LFA variables (model 8) but is not completely eradicated as with the 9th-year wages. Plausibly, this is the result of the process shown in figure 1, namely the time-dependent rising race-based gap in earnings, yielding a gap that is much wider in the 14th year than in the 9th year. Second, the linear effect of one percent increase in LFA on $t_{14}$ wages (0.009) is very similar to the effect on $t_9$ wages (0.010) although since there were 168 months in the first 14 post-schooling years, each percent now translates into about 1.7 months of employment. However, the effect of the squared term of LFA is larger after 14 years than after 9 years. Thus, an increase in LFA from 80 to 90 percent (translates now to additional 17 months of employment, or about a year and a half in a span of 14 years) is associated with 0.209 log points of wage gain while a similar 10 percentage points increase in LFA from 30 to 40 percent results in wage gain of 0.139 log points only (calculation based on model 8 point estimates). In sum, the increase in the premium for high levels of LFA between t9 and t14 magnifies the importance of accumulated experience in shaping life-time earnings of unskilled women.

We also examine whether there are group differences in the wage returns to LFA by replicating models 3, 6, and 9 and adding product terms between the two LFA variables and the group indicators. The results, presented in Table 7, show that none of

the product terms were significantly different from zero for skilled women. For the unskilled, we find that at $t_9$ the product terms between black and LFA and its squared term were negative and significant at 5% level. However, by $t_{14}$ the magnitude of these point estimates is much smaller and not statistically different from zero. Blacks' disadvantage in the returns to LFA at $t_9$ may capture a process of statistical discrimination against black women (Aigner and Cain, 1977). At $t_9$, given the recognized the average volatility of black women' attachment, employers may assume that future instability will follow and they compensate white women more generously for their attachment. However, the attenuation of the black disadvantage between $t_9$ and $t_{14}$ points to the impact of the knowledge gained by employers based on women' actual experience allowing them to rely less on signals and use the actual work history to set women' wages. Put differently, after a certain number of years in the labor market, the role signals that are correlated with group membership is weakening and actual and reliable information takes its place in setting wage offers. In other words, because it takes black women longer time to stabilize (whether in or out the labor force) the uncertainty employers are faced with regarding black women's commitment is diminishing at a slower pace.

[Table 7 About Here]

To illustrate this point we retrospectively track the employment history of unskilled women by their labor force status at $t_{14}$. Figure 2 depicts the LFA annual levels of black and white unskilled women in the 13 years that preceded the $t_{14}$ labor force participation. It is clear from the graph that women stabilize in their employment pathway- whether in or out the labor force- after the first decade or so. Using the terminology suggested by Clogg et al. (1990)—that classifies women into three major

groups of workers: stably active; unstably active; or stably inactive—we see that after the first decade most women are either stably active or stably inactive. Thus, in the first decade employers encounter workers with diverse levels of attachment but have relatively little information to know which woman will become stably active (therefore more productive, making investment in on-the-job-training worthwhile and justifying higher wages) or stably inactive. This situation of high uncertainty renders itself to statistical discrimination.

[Figure 2 About Here]

Since white women are more committed, on average, to market activity than blacks during the first decade, employers use workers' color as a signal to identify the future-to-be stably inactive. Black women late entry to the labor market is misleading because in the first five post-schooling years future-stably-inactive whites are more attached to the market than future-stably-active blacks. With a longer perspective on workers attachment, distinguishing stably active from unstably active workers is easier and does not require relying on the employee color as a signal. Unfortunately, this correction may be too late for many because most of the lifetime wage growth occurs during a worker's first ten years in the labor market (Topel and Ward, 1992; Bernhardt et. al. 2001).

**Discussion**

Race and ethnic-based wage differentials may be attributed to pre-market processes, such as educational attainment, schooling quality or the timing of childbearing. In this paper, however, we focus on the role of labor market processes in creating and

maintaining group wage differentials among women with similar levels of educational attainment. We find a constant race and ethnic wage gaps among women with some college education and a widening race gap among women with no college education. The latter pattern emphasizes the importance of market-related processes in generating wage inequality among unskilled women. We document substantial race and ethnic gaps within this group in the accumulation of labor force attachment, especially immediately after the school-to-work transition. The initial gaps are so large that minority women never catch up with their white counterparts. This experience deficit plays a critical role in explaining the diverse wage trajectories of white, black and Hispanic women with no college education.

While women with low levels of formal education rely on accumulated market experience for their wage growth, unskilled minority women are unable to benefit from this market-related process. The key question is why unskilled minority women fail to generate on-the-job human capital. The simple answer to that question is about timing: they delay entry to the market and let pass the formative period during which trajectories of wage growth are established. From the onset of their career they accumulate experience deficits that get magnified over time and, consequently, they are unable to recover from that initial disadvantage. Since the period of career formation is critical for earning prospects and future well-being, it is important to identify the array of mechanisms that impede the establishment of stable employment.

Our study supports others conducted before us, suggesting that employability is not only shaped by individual characteristics but also by market conditions which limit the accessibility of some women to some jobs (Taniguchi and Rosenfeld, 2002; Stier and

Tienda, 2001; Hsueh and Tienda, 1996; Hodge, 1973). Minority women employability is found to be especially sensitive to structural arrangements and economic cycles because the most vulnerable workers are the less skilled women (Tienda, et al., 1992). In that respect, our result may capture period effects on the capacity of unskilled minority women to secure a stable employment. The women in our sample entered a labor market, that due to industrial restructuring, technological development and shifts in international trade patterns, favors the more educated. The decline of unskilled and semi-skilled jobs during a period of massive industrial restructuring is one of the key reasons cited for the rising wages inequality between more- and less-educated workers during the 1970's and 1980's (Bernhardt et. al. 2001; Katz and Murphy, 1992). What is more, labor market hardships associated with industrial restructuring were not evenly distributed among demographic lines, as studies document that minorities lost ground more than whites (Tienda et al, 1992; Wilson, 1987).

Finally, evidence regarding the persistent effect of race on employment opportunities, especially at the hiring stage of the employment process, may account for some of the disadvantage black and Hispanic women face in accumulating work experience (Pager and Western, 2005; Pager, 2003). Using audit methodology, Pager and Western (2005) sent male testers, who presented themselves as high school graduates, to apply to low-wage entry level jobs. They demonstrate a strong racial hierarchy, in terms of getting a job offer, with white job seekers in the lead, followed by Hispanics, and with blacks falling behind. Moreover, minority applicants reported higher levels of downward channeling, to lower-ranked jobs that do not require customer service. These findings are especially important because they underscore the prevalence of racial and ethnic

discrimination in low-wage labor markets. It is also possible that the influx of unskilled workers due to industrial restructuring intensified employers' tastes against minority employees. Thus, if the labor market treatment of the less educated women varies by race, as the evidence suggests it is for men, it can explain why minority unskilled women, blacks in particular, fall behind whites in securing a stable employment and accumulating valuable work experience.

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## Endnotes

[1] A randomly drawn oversample of black youth is included in the analysis.

[2] Many respondents, especially those ages 18-21 at the first interview, had held one or more jobs that were not accurately reported in the survey. Restricting the sample to women who were ages 14-17 as of 1979 minimizes problems caused by left censoring of labor force participation (dropping 2,346 women).

[3] 49 women had zero LFA between $t_1 - t_9$.

[4] AFQT is a subset of 4 out of 10 ASVAB tests used by the military for enlistment screening and job assignment. It is the summed score from the word knowledge, paragraph comprehension, mathematics knowledge, and arithmetic reasoning ASVAB tests.

[5] Following Carneiro, Heckman and Masterov (2005) we use age-corrected AFQT which is the standardized residual from a regression of the AFQT score on age at the time of the test. Because we use the younger subset of the NLSY panel, the AFQT (administered in 1980) reflects human capital gains of our respondents when they were ages 15-18. As such, the test scores could not be affected by direct labor market discrimination (Neal and Johnson, 1996; Carneiro, Heckman and Masterov, 2005). However, such discrimination might influence the efforts parents exert in investing in the human capital of their own offspring (Carneiro, Heckman and Masterov, 2005).

[6] For unskilled women we also estimated parallel models for LFA accumulated from $T_1$ to $T_{14}$. These models yield similar results because, as shown n Table 2, gaps in LFA open relatively early. We do not present these results, and it is available from the authors.

[7] We also examined a specification that takes into account the timing of childbearing (including child bearing while in school). It demonstrates that it is linearly related to the accumulation of LFA: child bearing just upon career launching has a more deleterious consequence for LFA than children born when mothers already formed connections to the world of work.

[8] The positive effect of maternal employment can capture unobserved attributes like maternal education, parenting strategies, upbringing or general socioeconomic status but can also represent the importance of maternal role model for shaping teenagers' future commitment to the world of work.

[9] Since there were 108 months between $t_1$ and $t_9$ (9*12), 1 percent of LFA translates into, approximately, one month of employment.

[10] The inclusion of the LFA variables significantly improves the explained variance of $t_9$ wages (the incremental F statistic is large and statistically significant from zero [$F(2, 729) = 80.13$; $p < 0.000$]).

**Table 1: Effective Sample Sizes by Post-schooling Year and Educational Attainment, Women NLSY79**

| Post schooling year | TOTAL | HSDROP | age | HS | age | SCOL | age | COLL | age |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1780 | 318 | 17 | 679 | 18 | 441 | 20 | 342 | 23 |
| 2 | 1780 | 318 | 18 | 679 | 19 | 441 | 21 | 342 | 24 |
| 3 | 1780 | 318 | 19 | 679 | 20 | 441 | 22 | 342 | 25 |
| 4 | 1780 | 318 | 20 | 679 | 21 | 441 | 23 | 342 | 26 |
| 5 | 1780 | 318 | 21 | 679 | 22 | 441 | 24 | 342 | 27 |
| 6 | 1780 | 318 | 22 | 679 | 23 | 441 | 25 | 342 | 28 |
| 7 | 1780 | 318 | 23 | 679 | 24 | 441 | 26 | 342 | 29 |
| 8 | 1780 | 318 | 24 | 679 | 25 | 441 | 27 | 342 | 30 |
| 9 | 1780 | 318 | 25 | 679 | 26 | 441 | 28 | 342 | 31 |
| 10 | 1438 | 318 | 26 | 679 | 27 | 441 | 29 | 0 | |
| 11 | 1438 | 318 | 27 | 679 | 28 | 441 | 30 | 0 | |
| 12 | 1438 | 318 | 28 | 679 | 29 | 441 | 31 | 0 | |
| 13 | 997 | 318 | 29 | 679 | 30 | 0 | | 0 | |
| 14 | 997 | 318 | 30 | 679 | 31 | 0 | | 0 | |
| 15 | 318 | 318 | 31 | 0 | | 0 | | 0 | |

**Table 2a: Labor force attachment between the First and Ninth Post-Schooling Years, by Race**

| | All women | | | | | |
|---|---|---|---|---|---|---|
| | Incidence of Employment | | | % Months Emplyed | | |
| Post schooling year | Black | Hisp | White | Black | Hisp | White |
| 1 | 0.63 | 0.76 | 0.90 | 60.5 | 64.3 | 74.7 |
| 2 | 0.67 | 0.77 | 0.90 | 67.0 | 69.1 | 80.0 |
| 3 | 0.68 | 0.77 | 0.90 | 72.3 | 72.6 | 82.7 |
| 4 | 0.73 | 0.76 | 0.89 | 72.4 | 72.4 | 84.4 |
| 5 | 0.73 | 0.78 | 0.88 | 77.7 | 76.1 | 85.0 |
| 6 | 0.76 | 0.76 | 0.87 | 77.3 | 80.6 | 86.5 |
| 7 | 0.76 | 0.75 | 0.88 | 81.5 | 83.1 | 86.3 |
| 8 | 0.79 | 0.75 | 0.86 | 80.7 | 82.9 | 87.1 |
| 9 | 0.79 | 0.76 | 0.83 | 82.4 | 81.2 | 87.4 |

**Table 2b: Labor force attachment in the First Post-Schooling Years, by Race and Skill Level**

| | Skilled Women | | | | | | Unskilled Women | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Incidence of Employment | | | % Months Emplyed | | | | Incidence of Employment | | | % Months Emplyed | | |
| Post schooling year | Black | Hisp | White | Black | Hisp | White | Post schooling year | Black | Hisp | White | Black | Hisp | White |
| 1 | 0.84 | 0.87 | 0.95 | 72.0 | 74.0 | 81.5 | 1 | 0.48 | 0.70 | 0.85 | 46.7 | 57.8 | 67.2 |
| 2 | 0.89 | 0.88 | 0.95 | 78.5 | 79.8 | 85.3 | 2 | 0.52 | 0.71 | 0.85 | 53.2 | 61.8 | 74.1 |
| 3 | 0.88 | 0.88 | 0.95 | 81.6 | 83.9 | 87.4 | 3 | 0.54 | 0.71 | 0.84 | 61.7 | 64.9 | 77.4 |
| 4 | 0.93 | 0.88 | 0.95 | 84.9 | 84.6 | 87.9 | 4 | 0.60 | 0.69 | 0.83 | 58.9 | 63.8 | 80.5 |
| 5 | 0.91 | 0.90 | 0.94 | 86.6 | 88.4 | 89.0 | 5 | 0.60 | 0.72 | 0.83 | 68.3 | 67.8 | 80.4 |
| 6 | 0.93 | 0.89 | 0.94 | 86.8 | 89.0 | 88.3 | 6 | 0.64 | 0.69 | 0.80 | 67.7 | 74.6 | 84.3 |
| 7 | 0.94 | 0.88 | 0.94 | 89.0 | 88.1 | 87.7 | 7 | 0.64 | 0.68 | 0.82 | 74.0 | 79.7 | 84.8 |
| 8 | 0.93 | 0.84 | 0.90 | 87.7 | 90.3 | 90.1 | 8 | 0.69 | 0.69 | 0.82 | 74.2 | 78.0 | 83.9 |
| 9 | 0.91 | 0.88 | 0.86 | 88.5 | 87.8 | 91.0 | 9 | 0.70 | 0.70 | 0.81 | 76.9 | 76.7 | 83.6 |
| | | | | | | | 10 | 0.69 | 0.67 | 0.81 | 76.9 | 78.5 | 82.5 |
| | | | | | | | 11 | 0.71 | 0.67 | 0.80 | 75.4 | 80.8 | 84.6 |
| | | | | | | | 12 | 0.66 | 0.68 | 0.77 | 80.6 | 81.2 | 86.1 |
| | | | | | | | 13 | 0.66 | 0.68 | 0.80 | 76.1 | 82.5 | 87.4 |
| | | | | | | | 14 | 0.67 | 0.67 | 0.82 | 81.3 | 82.9 | 86.9 |

**Table 3: The Timing of First Job between the First and Ninth Post-Schooling Years, by Race**

| Post schooling | All | Skilled Women | | | Unskilled Women | | |
|---|---|---|---|---|---|---|---|
| year | % | Black | Hisp | White | Black | Hisp | White |
| 1 | 78.48 | 84.12 | 86.82 | 94.54 | 48.36 | 70.34 | 85.21 |
| 2 | 8.71 | 9.44 | 4.65 | 3.8 | 18.51 | 10.17 | 5.87 |
| 3 | 3.88 | 2.15 | 2.33 | 1.19 | 8.36 | 6.78 | 2.82 |
| 4 | 1.97 | 1.29 | | 0.24 | 5.07 | 3.81 | 1.17 |
| 5 | 1.46 | 0.43 | 2.33 | 0.24 | 4.18 | 0.85 | 1.17 |
| 6 | 0.9 | 0.43 | | | 2.39 | 1.69 | 0.7 |
| 7 | 0.45 | 0.43 | 0.78 | | 1.79 | | |
| 8 | 0.79 | 0.86 | | | 2.39 | 0.85 | 0.47 |
| 9 | 0.62 | | | | 1.19 | 1.69 | 0.7 |
| No Employment Incidence Until t9 | 2.75 | 0.86 | 3.1 | | 7.76 | 3.81 | 1.88 |

**Table 4: Determinants of labor force attachment between T1-T9 Post-Schooling Years, by Skill Level**

| | Skilled | | | Unskilled | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Black | -5.137** | 1.647 | 2.153 | -26.306** | -8.210** | -6.563** |
| | (1.886) | (2.041) | (1.915) | (2.209) | (2.238) | (2.077) |
| Hispanic | -6.596** | 1.417 | 1.445 | -17.333** | -1.554 | -2.918 |
| | (2.324) | (2.252) | (2.092) | (2.455) | (2.182) | (2.016) |
| College diploma/HS diploma | | 8.129** | 5.408** | | 12.916** | 9.974** |
| | | (1.714) | (1.699) | | (1.834) | (1.748) |
| Number of Children Ever Born (by T9) | | -9.673** | -9.045** | | -9.279** | -8.139** |
| | | (0.934) | (0.873) | | (0.755) | (0.703) |
| Marital Status (T1) | | 3.004 | 2.184 | | -1.097 | -1.314 |
| | | (1.846) | (1.715) | | (1.844) | (1.703) |
| AFQT (age-corrected ) | | -0.325 | -1.316 | | 8.846** | 7.220** |
| | | (0.942) | (0.886) | | (1.228) | (1.139) |
| FamIncY79 in 1000 of R | | 0.191** | 0.137* | | 0.265** | 0.155 |
| | | (0.066) | (0.061) | | (0.087) | (0.081) |
| Mother ever worked | | 1.401 | 0.469 | | 7.424** | 4.758** |
| | | (1.719) | (1.598) | | (1.745) | (1.617) |
| Average Unemployment Rate T1-9 | | | -0.572 | | | -1.700** |
| | | | (0.343) | | | (0.421) |
| lnwg post1_2 | | | 6.424** | | | 10.242** |
| | | | (1.689) | | | (2.043) |
| nowg1_2 | | | -18.979** | | | -4.287 |
| | | | (4.558) | | | (3.990) |
| Constant | 81.423** | 76.532** | 73.685** | 65.737** | 55.880** | 60.480** |
| | (1.125) | (2.544) | (4.988) | (1.466) | (3.022) | (5.728) |
| N | 783 | 779 | 779 | 997 | 976 | 976 |
| R-squared | 0.02 | 0.21 | 0.32 | 0.13 | 0.43 | 0.52 |

Standard errors in parentheses

* significant at 5%; ** significant at 1%

**Table 5: OLS Models of (ln) Wage in T9 Post-Schooling Year, All Women**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| LFA t9 | 0.008** | | | | |
| | (0.001) | | | | |
| # of LFP years | | 0.124** | | | |
| | | (0.008) | | | |
| LFA t1-t9 (centered) | | | 0.011** | 0.012** | 0.008** |
| | | | (0.001) | (0.001) | (0.001) |
| LFA_SQ t1-t9 (centered) | | | | 0.00006** | 0.00004* |
| | | | | (0.000) | (0.000) |
| controls | no | no | no | no | yes |
| Constant | 1.574** | 1.228** | 2.223** | 2.181** | 2.038** |
| | (0.048) | (0.069) | (0.013) | (0.019) | (0.047) |
| N | 1409 | 1409 | 1409 | 1409 | 1409 |
| R-squared | 0.12 | 0.14 | 0.24 | 0.24 | 0.35 |

Standard errors in parentheses

* significant at 5%; ** significant at 1%

Controls: race/ethnicity, number of children, marital status, AFQT, educational attainment

**Table 6: OLS Models of (ln) Wage in T9 or T14 Post-Schooling Year, by Skill Level**

| | Skilled | T9 | | Unskilled | T9 | | | Unskilled | T14 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | | (7) | (8) | (9) |
| Black | -0.242** | -0.181** | -0.058 | -0.219** | -0.031 | 0.035 | Black | -0.241** | -0.097* | -0.051 |
| | (0.045) | (0.043) | (0.048) | (0.044) | (0.042) | (0.047) | | (0.043) | (0.041) | (0.046) |
| Hispanic | -0.055 | -0.013 | 0.102* | -0.048 | 0.047 | 0.108* | Hispanic | -0.068 | -0.002 | 0.039 |
| | (0.056) | (0.053) | (0.052) | (0.050) | (0.046) | (0.047) | | (0.048) | (0.044) | (0.046) |
| LFA t1-t9 (centered) | | 0.010** | 0.007** | | 0.010** | 0.009** | LFA t1-t14 (centered) | | 0.009** | 0.008** |
| | | (0.001) | (0.001) | | (0.001) | (0.001) | | | (0.001) | (0.001) |
| LFA_SQ t1-t9 (centered) | | 0.000 | 0.000 | | 0.00005* | 0.00005* | LFA_SQ t1-t14 (centered) | | 0.00007** | 0.00007** |
| | | (0.000) | (0.000) | | (0.000) | (0.000) | | | (0.000) | (0.000) |
| HS diploma/College diploma | | | 0.339** | | | 0.067 | HS diploma/College diploma | | | 0.025 |
| | | | (0.040) | | | (0.043) | | | | (0.041) |
| Number of Children Ever Born (by T9) | | | -0.059** | | | 0.002 | Number of Children Ever Born (by T14) | | | -0.006 |
| | | | (0.023) | | | (0.019) | | | | (0.015) |
| Marital Status (T9) | | | 0.007 | | | -0.054 | Marital Status (T14) | | | -0.044 |
| | | | (0.037) | | | (0.036) | | | | (0.036) |
| AFQT (age-corrected ) | | | 0.033 | | | 0.116** | AFQT (age-corrected ) | | | 0.078** |
| | | | (0.023) | | | (0.027) | | | | (0.025) |
| Constant | 2.529** | 2.386** | 2.230** | 2.099** | 2.066** | 2.036** | Constant | 2.173** | 2.067** | 2.084** |
| | (0.027) | (0.037) | (0.048) | (0.028) | (0.029) | (0.053) | | (0.027) | (0.031) | (0.053) |
| N | 675 | 675 | 675 | 734 | 734 | 734 | N | 717 | 717 | 717 |
| R-squared | 0.04 | 0.15 | 0.27 | 0.03 | 0.21 | 0.24 | R-squared | 0.04 | 0.22 | 0.23 |

Standard errors in parentheses

* significant at 5%; ** significant at 1%

**Table 7: OLS Models of (ln) Wage in T9 or T14 Post-Schooling Year, by Skill Level - Multiplicative Models**

| | T9 | | | T14 |
|---|---|---|---|---|
| | Skilled (1) | Unskilled (2) | | Unskilled (3) |
| Black | -0.100 | 0.068 | Black | -0.003 |
| | (0.068) | (0.057) | | (0.060) |
| Hispanic | 0.093 | 0.068 | Hispanic | 0.016 |
| | (0.086) | (0.060) | | (0.067) |
| LFA t1-t9 (centered) | 0.007** | 0.010** | LFA t1-t14 (centered) | 0.009** |
| | (0.002) | (0.001) | | (0.001) |
| LFA_SQ t1-t9 (centered) | -0.000 | 0.000 | LFA_SQ t1-t14 (centered) | 0.00009* |
| | (0.000) | (0.000) | | (0.000) |
| Black*LFA t1-t9 (centered) | -0.000 | -0.005* | Black*LFA t1-t14 (centered) | -0.003 |
| | (0.002) | (0.003) | | (0.002) |
| Hisp*LFA t1-t9 (centered) | 0.000 | 0.001 | Hisp*LFA t1-t14 (centered) | 0.001 |
| | (0.003) | (0.003) | | (0.002) |
| Black*LFA_SQ t1-t9 (centered) | 0.000 | -0.0001* | Black*LFA_SQ t1-t14 (centered) | -0.000 |
| | (0.000) | (0.000) | | (0.000) |
| Hisp*LFA_SQ t1-t9 (centered) | 0.000 | 0.000 | Hisp*LFA_SQ t1-t14 (centered) | 0.000 |
| | (0.000) | (0.000) | | (0.000) |
| controls | yes | yes | | yes |
| Constant | 2.247** | 2.023** | Constant | 2.067** |
| | (0.054) | (0.055) | | (0.057) |
| N | 675 | 734 | N | 717 |
| R-squared | 0.27 | 0.25 | R-squared | 0.24 |

Standard errors in parentheses
* significant at 5%; ** significant at 1%
Controls: race/ethnicity, number of children, marital status, AFQT, educational attainment

**Appendix A1: Definitions and descriptive statistics of variables included in the analyses (means or percents)**

| Variable | Definintion | Mean | sd | Min | Max |
|---|---|---|---|---|---|
| $LNWGt_9$ | Person-months hourly real wages divided by the number of non-missing months with wage information at $t_9$ | 2.223379 | 0.5664794 | -2.153303 | 3.83755 |
| $LNWGt_{1-2}$ | wage rate t1 or, if not employed at t1, her wage rate t2 | 1.905176 | 0.464132 | -0.450986 | 3.384166 |
| nowg1_2 | a flag indicating whether she was missing a wage observation at both t1 and t2 | 0.1516854 | | 0 | 1 |
| $LFAt_{1-9}$ | cumulative number of employed months out of the total number of months between $t_{1-t9}$ | 64.2377 | 31.49509 | 0 | 100 |
| Black | Black | 0.3191011 | | 0 | 1 |
| Hisp | | 0.2050562 | | 0 | 1 |
| White | Non Black, Non Hispanic (reference category) | 0.4758427 | | 0 | 1 |
| HS Drop-out | If R completed less than 12 years of education | 0.1786517 | | 0 | 1 |
| HS Graduate | If R completed 12 years of education | 0.3814607 | | 0 | 1 |
| Some College | If R completed 13-15 year of education | 0.2477528 | | 0 | 1 |
| College Graduate | If R completed 16+ years of education (reference category) | 0.1921348 | | 0 | 1 |
| afqt89 | AFQT score | 36.59168 | 26.60938 | 1 | 99 |
| $Childt_9$ | number of children up to t9 | 1.065169 | 1.116698 | 0 | 7 |
| $Mart_1$ | if R married at $t_1$ | 0.2949438 | | 0 | 1 |
| FamY79 | Family income at age 14 ($ ‘000) | 14.37195 | 13.23582 | 0 | 75.001 |
| momevwk2 | Mother ever worked before 1979 | 0.688764 | | 0 | 1 |
| unempt1-9 | the average unemployment rate in the local labor markets within which the women reside in all post-schooling years | 7.957757 | 1.922315 | 3.2 | 17.33333 |
| N | | 1780 | | | |

**Figure 1a: Post-schooling mean hourly wage for NLSY women, by race/ethnicity**

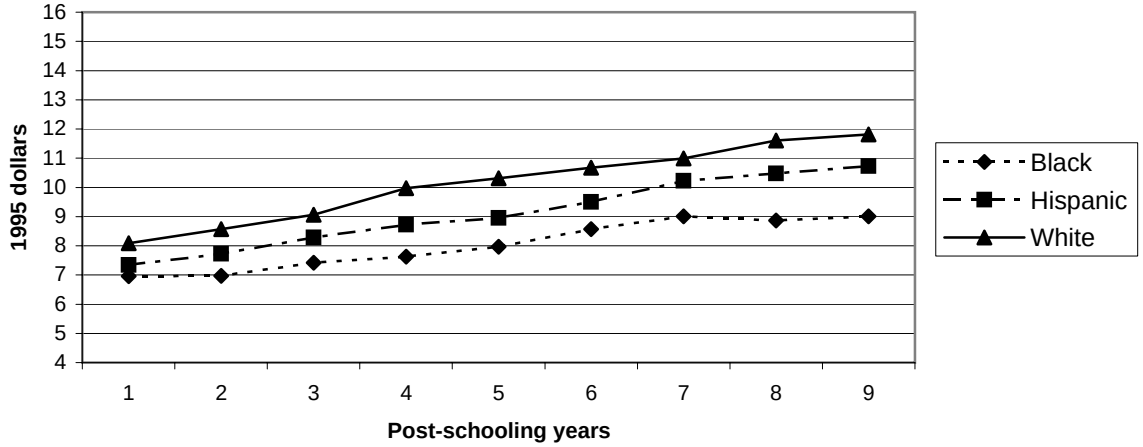


**Figure 1b: Post-schooling mean hourly wage for NLSY Skilled women, by race/ethnicity**

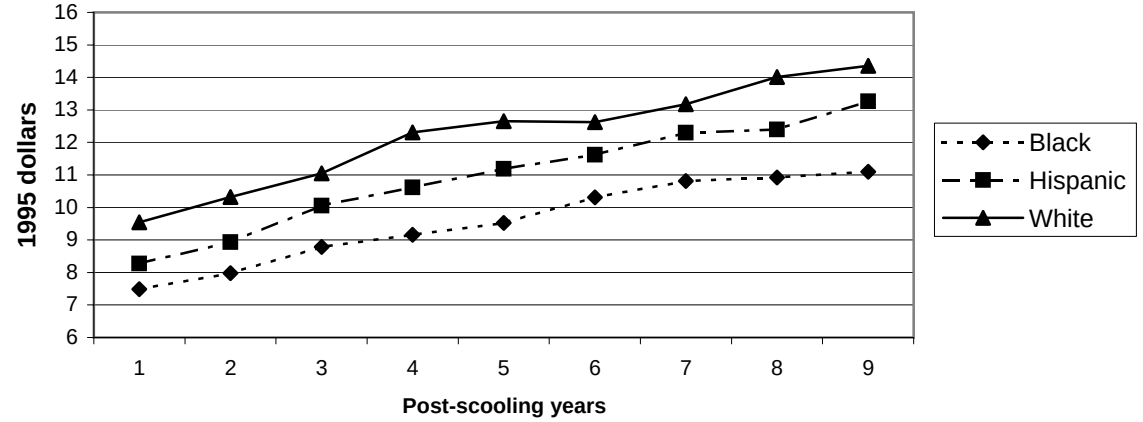


**Figure 1c: Post-schooling mean hourly wage for NLSY unskilled women, by race/ethnicity**

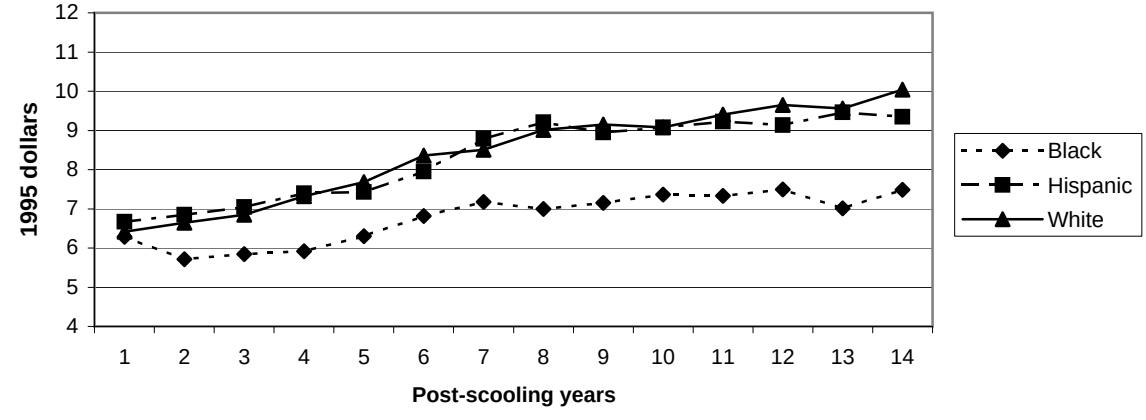

**Figure 2: Work History for Active and Non-Active Unskilled Women in T14**