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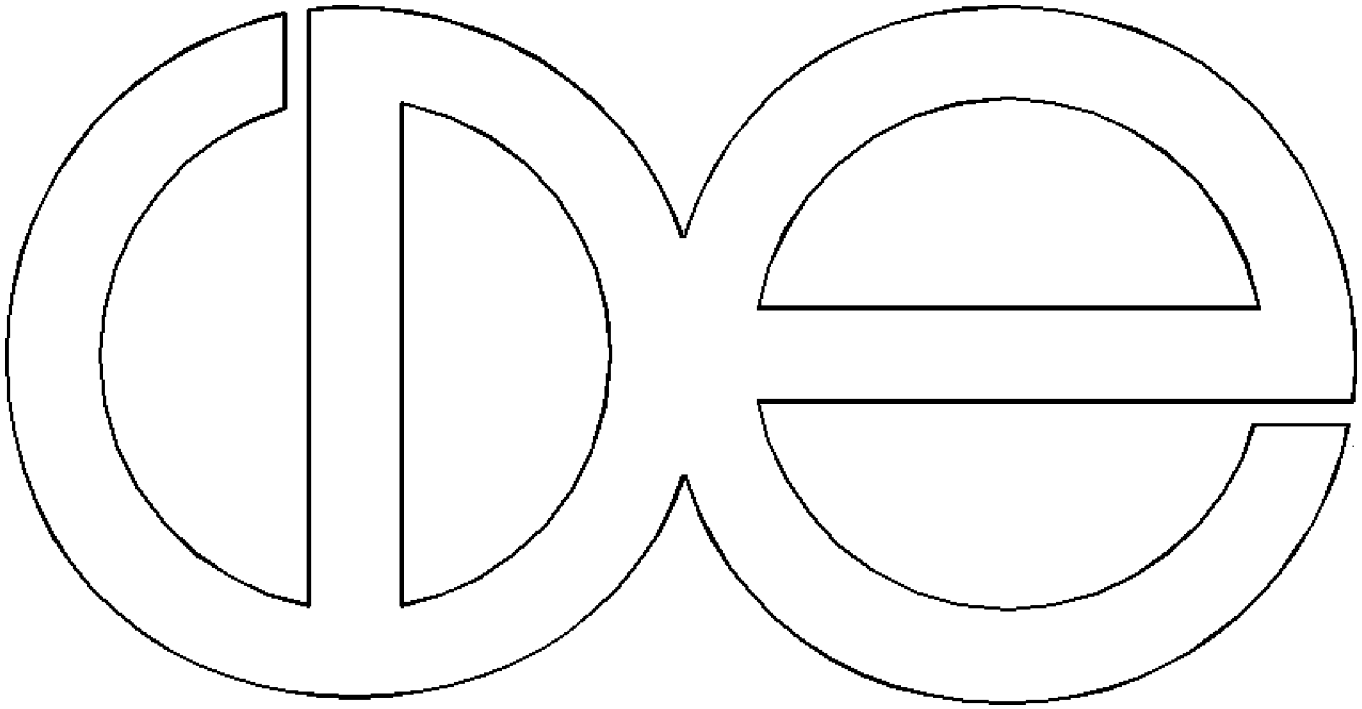

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ABSTRACT

Using detailed work history data from the female youth cohort of NLSY 1979-1991, this study analyzes the process of transition between employment and nonemployment over the life course to identify individual and structural determinants of the process. Work-related individual characteristics (e.g., education, ability, preferences) are all positively related to the durations of employment, while negatively related to the durations of nonemployment. Market wage also strongly affects the rate of exit from employment (negatively) and the rate of entry to employment (positively), but husband's income is not a significant determinant. These results corroborate recent findings that women, even during the early stage of career, are quite responsive to the economic opportunity of the labor market.

As women age while moving in and out of the labor market, considerably different work histories emerge among individuals. This study finds that individuals' past work history and work experience independently affect their employment transitions: the more experienced the woman and the more stable her past work history, the less likely to exit employment. Our event history analysis also shows that young women's employment-nonemployment transitions are time structured: the rate of exit from employment is negatively dependent on the duration of current employment, while the rate of entry into employment is negatively dependent on the duration of current nonemployment spell. This study also documents the importance of structural variables; the occupation, the sector of the labor market, and union status are all significant determining factors for individuals' rates of entry into and exit from employment.

INTRODUCTION

The dramatic increase in female labor force participation has been one of the marked socioeconomic trends in the U.S. and other developed countries during the second half of the 20th century (Nakamura et al. 1979; Oppenheimer 1970; Smith 1979; Smith and Ward 1985; Sweet 1973; Young 1990). Particularly dramatic was the rise in participation by young women during their childrearing years over the last two decades in the U.S. (Bianchi and Spain 1986; Leibowitz and Klerman 1994; U.S. Bureau of Census 1990). This increase has been accompanied by almost simultaneous changes in other aspects of women's life course, such as declines and delays in first marriage and first birth and increases in divorce rates over the same period (Bianchi and Spain 1986; Cherlin 1992; Sweet and Bumpass 1987).

Not only the rate but also the pattern of women's participation in market work has changed such that the degree of work attachment has now grown to rival that of men (Bianchi and Spain 1986; Bielby 1992; Gerson 1985; Masnick and Bane 1980; Waite 1981). It is observed that women now participate in market work in a more consistent pattern and are more likely to work full-time rather than part-time when they do participate, and, further, they tend to return to work after interruption (due to marriage and/or childbearing) at a higher rate than before (e.g., Blau and Ferber 1986; Klerman and Leibowitz 1990; Martin and Roberts 1984; Mott and Shapiro 1983; Smith and Ward 1985). Women are now more career-oriented from the early stage of their work lives and tend to invest more time in building their own work careers accordingly (Mott and Shapiro 1983; Parnes 1978).

Increased educational attainment, expansion of job opportunities with changing industrial and occupational structures in society, a decreasing wage gap between male and female workers, and economic pressures have been considered as the facilitating factors for the increased participation of women in market work (Bianchi and Spain 1986; Oppenheimer 1970; Smith and

Ward 1985). Rising educational attainment among younger cohorts of women may have increased the economic "costs" of not working outside the home or may have altered their "tastes" for market work, since more educated women tend to command higher wages if they work (Bianchi and Spain 1986). In addition to these economic incentives for participation in market work, historical changes in the institution of the family — as reflected in consistent increases in marital disruption and the growing proportion of mother-only families during the same period — might also have led young women of recent cohort to become increasingly aware of the importance of their own work careers as alternatives to their traditional family roles (e.g., marriage and childbearing) (Bumpass 1990; Oppenheimer 1988).

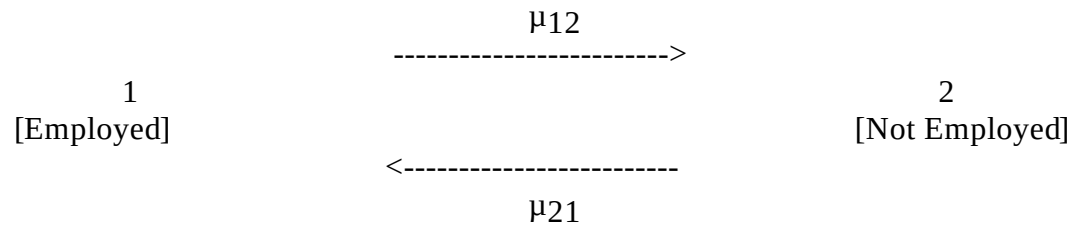
As work in the labor market is now becoming an integrated part of the life course for an increasing proportion of women, early work experiences now have more important implications for other aspects of women's early adult life and later socioeconomic achievements than before (e.g., Goldin 1983; Hogan 1981; Oppenheimer 1988; Osterman 1980). Market work, in fact, now has greater social and economic functions for women than before. Paid employment, for instance, provides women with economic independence, the importance of which is increasing as women's family life — with the increased risk of marital disruption — has now become less secure than before (Castro Martin and Bumpass 1989; Dechter 1991; Garfinkle and McLanahan 1986; Smock 1992). Participation in market work has also assumed a greater marriage market function for women by providing social networks that extend the perimeter of the individual's social life (Oppenheimer 1988). In addition, sociological studies of the early life-course transition suggest that events in the early stages of life are important determinants of socioeconomic attainments in subsequent stages of the life course (Hogan 1981; Shavit, Matras and Featherman 1990). With regard to the impact of early work experience on later achievement, Osterman (1980), for example, finds that, for youth, early job instability in the so-called "moratorium" period has an

adverse impact on the chances of later employment.

In spite of the growing importance of early work experience in structuring women's life course, not much study has been done on the dynamics and determinants of their labor market transitions (but see Felmlee 1984; Desai and Waite 1991). Past studies of female labor force participation (e.g., Cain 1966; Heckman and Willis 1977; Mincer 1969; Smith 1979; Sweet 1973) have often relied on cross-sectional data and the results provided only a limited information about the underlying processes. For example, the proportion of women working, the probability of participation in the labor force (or employment) at one point in time, and the number of hours or weeks worked in a given period of time — the conventional measures of women's labor supply — are all static measures (or outcomes) of the underlying dynamic process — transitions into and out of the labor force. More recent studies (Felmlee 1984; Lynch 1985; Moen 1985) pointed out the limits of those studies which, in most cases, were based on a static view of the process and emphasized the dynamic nature of the underlying process as they adopted the life-cycle perspectives on women's allocation of time between market and non-market work (e.g., Felmlee 1984; Flinn and Heckman 1982; Long and Jones 1980; Lynch 1985; Moen 1985). This study aims to move beyond the limitations of past studies by looking at the dynamic processes of women's labor market transitions that occur over the early stages — 20s and early 30s — of their adulthood.

Women's work life, in this study, is conceptualized as a process of continuous-time transitions between employment and nonemployment and thus alternating spells of employment and nonemployment as shown below.[1] By defining women's labor force status without part-time and full-time working within the employed state, we come to ignore the volume of labor (time) supplied. We would argue, however, that for women, whether or not to participate in the labor force is a more important decision than how many hours to be supplied to the labor market. In

most cases, women may first decide on whether or not to work and the decision on the amount of time to be spent in market work may be decided on the basis of the availability of work and changing family obligations or economic necessity (see Sweet 1973: 38). bwc



Let x(t) be a random variable that takes discrete values of 1 or 2, 1 representing employed state and 2, nonemployed state for a unit time interval (a week). Then a woman's work history will be described by the sample path of x(t) over time. We analyze the rates of transitions between the two alternative labor force states (i.e., μ_{12}, μ_{21}) and estimate the effects of individual characteristics and labor market structural factors on the transition rates.[2] With the former transition we deal with the duration of employment — how long a woman stays employed once she enters the state — and with the latter the duration of nonemployment — how long a woman stays nonemployed once she enters the state.

THEORETICAL FRAMEWORK

Life-Course Perspectives: Age and Life-Cycle Variations in Labor Market Transitic

Age has a good many implications for young women's labor market transitions. First of all, a woman's age is a good indicator of life stage, in particular of her marital and child status, as the process of family transition in society is more or less age-graded (Hogan and Astone 1986). Women's family status has independent and direct effects on their decision to participate in market work. Age has also been observed to be positively associated with women's attachment to market work (Moen 1985; Waite 1981); this may be so because age is closely correlated with

positive factors for women's work attachment, in which we can include, among others, psychological maturity (Mott and Shapiro 1978; Osterman 1980), accumulation of work-related resources and human capital (Mare et al. 1984), and movement into primary-sector firms (Thurow 1975).

Age, according to Mare et al. (1984), is positively associated with employment probability because educational composition of the out-of-school youth varies with age in a positive direction. That is, the older the out-of-school youth, the higher the educational attainment and the more stable the employment patterns. On the other hand, at the individual level, proponents of "aging stability" hypothesis (see Glenn 1980; Lorence and Mortimer 1985) posits that attitudes and values become more stable with age. Lorence and Mortimer (1985) find that whereas job involvement is quite volatile in the initial stage of work career, it becomes more stable as workers grow older. Young adults may be spending a productive "search" period for a best job or best role for their later life stage, which will be followed by a more stable employment period. Osterman (1980) describes youth as passing through two stages during early adulthood: a moratorium period in which non-work and peer group activity are more important than work and then a settling down period in which a steady job is important and desired. While the hypothesis has been mostly tested on male data, the question is Would the same hypothesis hold for young women? If it does, then we should observe decreasing rates of transition out of employment as women age into their late 20s and early 30s.

The dynamics of women's labor market transition is closely linked to the dynamics of their family formation processes (Moen 1985). Marriage and childbearing, in particular, are clearly the most salient life-course events that influence women's decisions on their labor force activities. These family formation events, whether they occur in an orderly or disorderly fashion, mark distinct stages of the life course and constitute the changing contexts in which women's labor

force transitions are to be made (Bielby 1992; Willekens 1987). The context determines the choice set or set of options from which women may choose. Women entering motherhood, for instance, may change their behavior with respect to fertility, labor force behavior, and time budgeting (Willekens 1987). Furthermore, the meaning and value of women's non-market time vary with their family status. For marriedwomen with children present, the alternative to market work can be clearly defined (e.g., homemaking, taking care of children, etc.) at least at the theoretical level. But for unmarried women without children, it is rather ambiguous.

Considering that among the sample members who are mostly in their 20s and early 30s, the most prevalent family formation events are the first marriageand the first childbirth, we focus on the two transition events; such restrictions also have the advantage of not confounding possible effects of subsequent marital and childbirth events on the employment transition. Past studies indicated that first marriage and first childbirth, in particular, have the most depressing effect on women's labor force activities (Cramer 1980; Desai and Waite 1991; Hout 1978). A young woman's family status is jointly defined by her first marriage and first birth status as: (1) before first marriage and first birth; (2) after first marriage and before first birth; (3) before first marriage but after first birth; (4) after first marriage and first birth. As a woman moves from one stage to another the opportunities and constraints related to her labor force behavior may also change. We let changes in family statusbe dynamically linked to changes in employment status (i.e., transition rates) by specifying the family status variable as a time-varying covariate in the hazard model that we employ .

The depressing effects of marriage and childbirth on women's participation in market work are well established in past studies. Based on a longitudinal observation of women's work careers, Rosenfeld (1980) found that being married and/or having children significantly increases the probability of discontinuity in employment in women's work lives. Although wives and

mothers — especially those with young children — have increasingly joined the labor force, Moen (1985) finds that married women's participation is more likely to be accompanied by casual and intermittent employment. We expect that family formation events (e.g., marriage and childbirth) are negatively associated with the probability of women remaining employed, and positively associated with the probability of being not employed over the life-course.[3]

Economic Theories of Female Labor Supply: Wage and Income Effect

The process of entry into and exit from employment involves voluntary decision making by a woman on the allocation of her time, a limited resource, between home work (or leisure) and market work.[4] The rational choice theory in neoclassical economics (e.g., Mincer 1969; Becker 1965) predicts that a woman would choose between home work and market work on the basis of the utility maximizing comparison of her market wage and reservation wage (Heckman and McCurdy 1980; Mincer 1969; Nakamura and Nakamura 1991; Schultz 1979). The market wage represents the market value of her time at work or her 'productivity' in human capitalist terms, while the reservation wage represents the value of her time at home taking care of children, and/or producing household goods, etc. The woman's market wage constitutes her 'opportunity cost of not working', i.e., the foregone wage by not working (Mott and Shapiro 1978; Nakamura et al. 1979), while the woman's reservation wage constitutes, conversely, the 'opportunity cost' of working that might accrue to her and her family. The behavioral hypothesis is that a woman will work if her offered market wage exceeds her reservation wage at zero hours of work (Gronau 1973; Heckman 1974; Nakamura et al. 1979).

The economic framework implies that women's participation in market work will be affected by factors that are positively or negatively related to women's market and reservation wages. Factors that increase the wife's reservation wage would decrease her probability of working and increase the probability of not working, while factors that increase the wife's market

wage will increase her probability of working and decrease the probability of her not working in the labor market if other conditions are the same.

A woman's market wage and employment probability have been observed to be positively related to a set of work-related individual characteristics, especially her stock of 'human capital': ability, education (training), preference for market work, and previous work experience. A woman's reservation wage, on the other hand, is largely believed to be a function of constraining factors for women's time that otherwise could have been available for market work. Since women still take the major responsibility for homemaking and childcare (Tilly and Scott 1978; Moen 1985), the value of a woman's time at home— her reservation wage — would vary closely with her marital and child status. Childbirth, in particular, is expected to exert the strongest negative impact on women's work-related activities, in that mother role responsibilities impact on women's time more intensively and have a higher priority over any other activities (Cramer 1980; McLaughlin 1982; Presser and Baldwin 1980; Sweet 1973). Thus, it is expected that women with children are more likely to be out of the labor force or discontinuously employed than women without children (Moen 1985; Sweet 1973). And similarly, women with younger children are more likely to be not working than mothers of older children (Sweet 1973).[5]

Individual Characteristics and Labor Market Transitions

Education, in particular, is believed to be the most important determinant of the wage rate that a woman can command and thus of the probability of her participation in market work (Becker 1965; Mincer 1969; Mincer and Polachek 1974). Thus, women with more education are expected to be more likely to be working at one point in time than women with less education because of the higher opportunity costs incurred by not working, given their higher wage potential. In addition, education is a good predictor of employability (Sweet 1973). And women with more education may be less likely to be unemployed once employed and more likely to be

(re)employed if they are unemployed. Similarly, other human capital variables — mental ability and preferences — are also believed to be positively related to the wage and employability and thus the probability of a women working in the labor market.

Past studies find that the relationship between women's education and employment depends on their family status. Moen (1985), using data from the PSID, found that while women with more education are more likely than women with less education to work full-time continuously at every stage of the family cycle, more highly educated mothers of preschoolers are more likely to move into and out of the labor force with a part-time job. In general, mothers with more education tend to spend more time with their children investing more in the 'quality' of their children and thus are less likely to be working in the labor market (Ermischi 1991; Hill and Stafford 1974; Leibowitz 1974; Moen 1985; Sweet 1973).

Women differ in their sex-role attitudes and preferences for market work vs. home work (Bielby and Bielby 1984; Rosenfeld and Spenner 1986; Desai and Waite 1991). Some women are more committed to work and to building up their own career in the labor market, while others prefer to stay at home and work only if the need arises; still others would like to combine work and family, moving in and out of the labor force frequently over the life-course (Desai and Waite 1991). Women who prefer market work to staying athome tend to invest more in their human capital (e.g., formal education and job training) than those who prefer home work (Sandell and Shapiro 1978; Polachek 1975). There is also evidence that tastes for market work affect the timing and number of children born (Waite and Stolzenberg 1976), which would, in turn, affect labor force activity. Thus, given that other conditions are the same, women with strong preferences for market work and positive attitudes toward women's work roles would be more likely to be working in the labor market than women with weak preferences and negative attitudes. Strong commitment to work may also attenuate the negative effects of marriage and

childbearing (e.g., Bielby 1992). Women having stronger career aspirations may not want to incur the depreciation of their earnings power which might accompany periods of non-participation (e.g., Long and Jones 1980).

Husband's Income and the Economic Need of the Family

Husband's income is also an important determining factor for wife's likelihood of working, especially when children are present. Husband's income or other family income, for example, can buy out the wife's market time for quality home production and care for children. Thus, the theory of household allocation of time (Becker 1965; Gronau 1973; Leibowitz 1974) posits that a rise in husband's income may prompt the wife to consume additional non-market time at the expense of market work (e.g., Cain 1966; Long and Jones 1980). Mincer (1969), thus, has argued that when young children are present, the "push" effect of mother's own wage is weaker than the "pull" effect of her husband's income due to the absence of good substitutes for the mother's time with young children (see also Leibowitz 1974). Drawing on the economic perspective, we expect that husband's income would exert a negative effect on wife's participation in and a positive effect on her withdrawal from the labor force.

Husband's income (or other family income) indexes the family's economic need as well. Given the number and age of the children and other dependents, the lower the husband's income, the higher the economic need of the family. Pressing financial need of the family, if present, would cause women to lower their reservation wage and to be eager to work for additional money, which may be the case among the disadvantaged (e.g., blacks). Thus the income effect hypothesis posits that the lower the husband's income, the lower the asking wage of the wife, and the higher the probability of women working in the labor market.

Past Work History and State Dependency in Labor Market Transitions

Past work history (experience) may also influence women's labor market transitions. Cumulated work experience represents an accumulation of job-specific skills through on-the-job training with which wage and promotion chances are also raised (Heckman 1979). As a woman's wage increases with her job experience, we expect that the woman will be less likely to withdraw from and more likely to reenter the labor force because the opportunity cost of not participating in the market work will be high otherwise. Further, if previous work experience or employment history is used by employers as an indicator of commitment to work and potential productivity on the job (Osterman 1980), women with stable and orderly employment history (i.e., a few long spells of employment) will then be more likely to be employed, if in the labor force, than women with unstable and discontinuous employment history (i.e., numerous short spells).

Recent research demonstrated that the greater the number of previous spells of unemployment and/or the longer their duration, the more likely that the individual will be unemployed (Heckman and Borjas 1980). Long spells of nonemployment would also lead to the loss of job skills and depreciation of human capital, which will again lead to decreasing probability of future employment. Accordingly, we expect that the longer the duration of the previous spells of nonemployment, the less likely it is that the individual will be employed. Women who have been out of the labor force for a long time may develop or acquire home work-oriented capital and preferences and be less likely to participate in market work. The opposite could be true of the effect of past employment experiences.

These considerations on the temporal dimension of labor market transitions suggest that, as a consequence of cumulated past work experience, otherwise identical women with the same work-related characteristics may, over time, become quite distinct in their labor force behavior (Heckman 1979). This relationship between past and current labor market participation is called

"state dependence" in labor market analysis (Heckman and Borjas1980). The concept of state dependence implicitly challenges the conventional assumption of "rational choice" in women's labor market transition as it is conceptualized in the human capital tradition. In economic studies of women's labor supply, a woman's choice between market-work and home-work has been depicted more or less as a voluntary decision making process under rational calculation of costs and benefits which are assumed to be largely determined by her human capital (i.e., wage potential) and family status (Becker 1965; Mincer 1969). Those cost and benefit factors are external to the state currently occupied (i.e., employment or nonemployment) and state occupancy does not, therefore, affect the occupant's future behavior. In this voluntaristic framework, the probability of a woman working or not working is conceived to be temporally independent and current labor market choice and decisions are temporally unrelated to past work status. Recent studies, drawing on dynamic analyses of longitudinal data, however, have emphasized the importance of state dependence in youth's labor market transitions (e.g., Heckman and Willis 1977; Heckman and Borjas 1980; Long and Jones 1980; Flinn and Heckman 1982; Lynch 1985). In this study we address the issue by determining how the rate of transition between employment and nonemployment is affected by the number and the length of past spells of employment and/or nonemployment.

Structural Factors Affecting Women's Employment and Nonemployment

While the individualistic view (e.g., human capital theory) of neoclassical economics puts more emphasis on the supply side and the voluntary choice of women, those who criticize this view point out the importance of the demand side of women's labor market participation (e.g., England 1982; Epstein 1970; Granovetter 1988; Tuma 1985). It could be that most women looking for work, especially if they are low-educated, may have accepted what was available or offered. In general, structural constraints — discrimination, short job ladder, limited promotion

opportunity, etc. — might be a more dominating factor than individual choices and preferences that explains women's pattern of labor market transitions (Reskin and Hartman 1986). Sociological theories of labor market have suggested that not only individual characteristics of the worker but also the occupational characteristics of the job and the sector of the labor market that the worker enters are independent determinants of an individual's labor market behavior and outcomes (Beck, Horan, and Tolbert 1978; Bielby and Baron 1986; England 1982; Granovetter 1988; Kalleberg and Sorensen 1979; Reskin and Hartman 1986).

The Occupational Characteristics of the Current or Previous Job

The kind of occupations in which women are employed matter because they may differ in employment behavior, compensation, and opportunities for career advancement among others. Low-prestige occupations such as service and manual labor are characterized by unstable employment, low wages, and less desirable working conditions. Women in these occupations, regardless of how they end up there,[6] would be less motivated to develop their long-run work career and be more exposed to the high risk of unemployment or withdrawal from the labor force (Reskin and Hartman 1986).

Barrett and Morgenstern (1974), in fact, find that women who work in female-dominated occupations are unemployed significantly longer than are other women. Goldin (1983) finds that women who began to work in a sales or manufacturing job stayed a shorter time in the labor force: about 11% points below women who began their work careers in professional and clerical jobs. Terry (1982) also finds that women in manufacturing and blue collar occupations are more likely to be laid off than men during a recession. That might be because in most male-dominated occupations, women are working at lower levels on the job ladder or lag behind in seniority (Epstein 1970). Osterman (1982) also finds that women's voluntary exit rates are much lower in industries in which there is great pressure from the federal government for affirmative action

programs. These findings suggest that women working in "better" occupations would be less likely to exit current employment.

Especially relevant to married women's labor market transitions are such occupational characteristics as compatibility with family responsibilities (Desai and Waite 1991; Rosenfeld and Spenner 1990) and the level of penalty or the fixed costs for the time out of work (Polachek 1979). Occupations differ not only in the opportunity structure that they provide but also in the flexibility of work schedules and the penalty that they claim on the time out of employment (Polachek 1979). That is, certain occupations, such as service jobs, are more compatible with women's family responsibilities (Desai and Waite 1991; Rosenfeld and Spenner 1990). In these occupations, part-time and full-time switches may be easier, and exit from and reentry into the job may be less costly. Women in these occupations may thenbehave differently than women in other occupations in terms of employment. Their work history may be more intermittent with frequent movement in and out of employment than for other women.

In this study we do not directly measure these specific characteristics of the occupation; instead, we classify women's current or previous occupations into a set of broad census categories, assuming that occupations in different categories differ in the aspects that makes women's attachment or return to employment easy or difficult. In addition to the occupational category, we also include two more measures of the "desirability" of the job: public vs. private sector and union status. Those two measures are intended to capture general desirability or security of employment for women workers. We expect that women working in the higher category occupations (e.g., professional and managerial), in the public sector, or at unionized jobs would be less likely to exit employment when other conditions are the same.

Local Labor Market Conditions

A woman's employment probability will also be affected by the economic conditions of

the labor market which the woman enters. Among other variables, the availability of jobs, which is often indexed by local unemployment rates, and the occupational and industrial structure in the residential area are the principal factors that would define the opportunity structure a young woman must face when she tries to enter the labor force. Women residing in areas with high unemployment rates will have more difficulty in accessing jobs and a higher probability of losing jobs or of leaving the labor force out of discouragement.

Duration Dependence and Unobserved Heterogeneity in Labor Market Transitions

In estimating dynamic models of transitions, the major methodological issues that often emerge include duration dependence and individual unobserved heterogeneity in the rates of transitions. These issues are directly related to the issue of unbiasedness in model estimation. But, at the same time, they also have some substantive implications for the nature of the process and for individuals' labor market behavior.

Duration dependence refers to the effect of the duration in current state on the rate of exiting the state. So duration dependence is defined to exist if the hazard rate depends on the length of time elapsed in the state in the current spell. Negative duration dependence means that the longer an individual has been in the state, the less likely she is to leave that state; positive duration dependence means that the longer the duration, the higher the rate of exit.

With regard to the rate of exit from employment, we expect a negative duration dependence in the employment to nonemployment transition. As women are staying longer in the labor market they may build up their own long-term work career with their wages increasing in their current employment. Work experience may also influence women's family plans and/or work attitudes, making them less likely to quit employment. In both cases, longer durations in the job would make women less likely to withdraw from the employment by increasing the opportunity cost of not working.

On the other hand, either negative or positive duration dependence could be observed in the nonemployment to employment transition. Positive duration dependence is expected from the job search view of the process (Lippman and McCall 1976); that is, as the spell of nonemployment lengthens, the reservation wage will fall if the woman is searching for work, and the hazard will increase as the woman will be more likely to accept any job offer arriving. On the other hand, negative duration dependence is expected from the human capitalistic view of the process. That is, as the individual's stay out of the labor force gets longer, her human capital will become more depreciated, and she will have trouble finding a new job that matches either the level of payment in the previous job or her level of education and other human capital. The result will be decreasing hazard of exit from the state of nonemployment as the spell lengthens.

It is well known that an unobserved variable missing in the model brings in a serious bias in the estimation of the hazard as dependent variable, even when the missing variable is uncorrelated with other variables in the model (Trussell and Richards 1985). Thus correction for the unmeasured heterogeneity is a requisite for consistent parameter estimates in hazard models. Unobserved heterogeneity, if ignored when it actually exists, can lead to seriously biased estimates of duration dependence. Family background, mental ability, and attitude variables to be included in our models are expected to capture much of the individual heterogeneity. In addition, the (cumulative) duration of past spells of employment (or of nonemployment) has often been used as a proxy for unobserved heterogeneity. Unobserved heterogeneity, however, can still arise from other sources such as women's unobserved 'reservation wage' and unmeasured fixed costs of labor market entry and exit (Heckman and Willis 1977). In our analytic models, the unobserved component of individual heterogeneity will be explicitly taken into account (see below).

DATA, VARIABLES, AND STATISTICAL MODEL

The Data

The data for this study come from 13 waves of the National Longitudinal Surveys of Youth (NLSY) for 1979-1991 (CHRR 1993b) The NLSY cohort of youth is a sample of 12,686 males and females who were 14 to 21 years of age at the time of the base year survey (1979). The NLSY youth sample was designed to be representative of the corresponding cohort (of a particular sex, race, and age) in the non-institutionalized civilian population of the United States at the time of the initial survey (CHRR 1993a). All civilian sample selection was accomplished through a multi-stage stratified area probability sample of dwelling units and group quarter units (CHRR 1993a). The NLSY conducted interviews yearly since 1979.

Out of the NLSY, only the female subsample will be used for our analysis. We further restrict our analysis to white and black females and focus on black-white differences in women's labor force activity. To ensure that our sample is a nationally representative sample of young women, black and white female respondents from the cross-sectional sample are selected, to which black females from the supplemental sample are added to increase the size of the black sample. The resulting sample size is 2477 for whites and 1472 for blacks (405 from the cross-sectional sample + 1067 from the supplemental sample), totaling 3949.

Sample retention rates for NLSY were very high throughout the regular surveys (above 90%). Sample members who missed an interview for a certain year are recontacted in the following years, so the retention rates do not decrease linearly but fluctuate to a small degree Returning to the following survey those once lost by attrition helps us construct an uninterrupted continuous history of school, work, and family transitions for our sample members. That is, NLSY surveys collected a complete retrospective information up to and including the respondent's most recent date of interview. By scanning the retrospective information, we can

construct a continuous work history either up to the time when the respondent permanently attrites or to the time of the latest survey (i.e., 1991).

Weekly labor force status of each of our sample members will be constructed out of the detailed history of employment dates (e.g., starting and stopping dates) and gaps 'between' and 'within jobs' collected during the regular surveys from 1979 through 1991 for NLSY (1968 through 1978 for NLSYW). For NLSY, we utilize the work history file created by CHRR (1993c). The work history file contains a complete week-by-week work history in which bias due to attrition is minimized in the following way. In the event that a respondent is not interviewed for one or more years, she/he is asked to provide, at the reinterview point, retrospective information in order to maintain a continuous work history in the work history file.

The work history variables enable us to determine — along with a rich set of the characteristics of the job — whether a respondent, during any of the 730 weeks since the first week of January 1978, was: (a) working; (b) associated with employer[7]; (c) unemployed; (d) out of the labor force; or (e) not working (i.e., (c) vs. (d) cannot be distinguished).[8] Focusing on a respondent's employment status, we collapse the detailed NLS labor force status into three employment-based statuses following the CPS convention, i.e., (1) employed if a respondent is working or associated with an employer (i.e., a or b above)[9]; (2) unemployed (i.e., c); (3) out of the labor force (i.e., d or e) if a respondent is out of the labor force or if unemployed vs. out of the labor force status cannot be distinguished. For analytical purposes, we may further collapse categories (2) and (3) into 'non-employment' status considering the weak and ambiguous status of the 'unemployed' category for youth (see Clark and Summers 1982).

Construction of the Spells of Employment and Nonemployment

In event history models, the basic unit of analysis is a spell. As such, spells of employment and nonemployment constitute the unit of analysis in our models for labor market transitions. The

construction of spells of employment and nonemployment is based on a week-by-week continuous work history of our sample members since completion of school or during interrupted schooling periods (except for summer vacations). The construction of nonemployment spells is straightforward. In accordance with our definition, it starts whenever a woman is out of the labor force or unemployed, and ends when the woman returns to employment later; basically, gaps between employment constitute the nonemployment spell. A spell of employment spans the entire period during which a woman is employed in the labor market. Individuals may contribute as many spells of employment and/or nonemployment as they stay in the sample. Respondents may also work for more than one employer at the same time period or for a short or long overlapping time period. This case is most prevalent among younger members of our sample. For these cases, we concatenate the overlapping spells of employment into one continuous spell of employment. As a result, the constructed spells of employment may consist of more than one employment with different employers when they overlap in duration or when the starting week of a new employment falls right after the stopping week of the previous employment.[10] Our intention here is to construct a continuous-time profile of young women's employment-nonemployment switch over the early life-course. The constructed spells of employment and nonemployment, then, are meant to reflect women's time in and out of employment in the labor market rather than time in a specific job. Our analysis, hence, is on employment transitions rather than on job transitions.[11]

Tables 1 and 2 summarize the distribution of the number of employment and nonemployment spells among our sample members by race. The white sample (N = 2202) experiences a total of 10342 and 9168 spells of employment and of nonemployment, respectively, during the whole life-span observed , that is, from completion of school to the last interview. The corresponding numbers for the black sample (N = 1424) are 5791 and 6081. The original sample sizes were 2279 for whites and 1272 for blacks. Thus, over 96% of the original white and black

sample members have experienced spells of either employment or nonemployment. Some women experience multiple spells of relatively short duration, whereas other women experience a small number of relatively long spells. Still other women fall in between the two extremes.

Definition and Measurement of Independent Variables

Selection and measurement of the covariates to be included in the event history models are based on our theoretical review. Independent variables to be used in our multivariate hazard models can be classified into seven categories: (1) life course variables: age and life stage; (2) family socioeconomic background; (3) human capital and attitudes; (4) past work history and experience; (5) own wage and the economic need of the family; (6) residential and local labor market conditions; and (7) the occupational characteristics of the current or previous job. Table 3 presents the definitions, means, and standard deviations of the variables included in the model.[12]

The ASVAB (Armed Services Vocational Aptitude Battery) was administered in a special survey during 1980. 94% of the original 1979 sample completed the test. The ten areas are: 1) general science; (2) arithmetic reasoning; (3) word knowledge; (4) paragraph comprehension; (5) numerical operation; (6) coding speed; (7) auto and shop information; (8) mathematics knowledge; (9) mechanical comprehension; and (10) electronics information. Individual raw scores (number correct) and scale scores are available in the NLSY. We use the scaled scores because users are strongly encouraged to use the scaled scores rather than the raw scores (CHRR 1993a).

Statistical Model

For the multivariate analysis of women's employment and nonemployment transitions we adopt a continuous time event history model. The continuous time model is better than the discrete time model — upon which past studies of employment transitions have relied — because

it avoids time-aggregation bias (Tuma and Hannan 1984; Tuma, Hannan, and Groenoveld 1979). Consideration of time-aggregation bias is critical when we analyze labor market transitions for youth, which tend to be dynamic and short-spelled.

Let the rate of exiting state j after duration t in the state for individual i be $h_{ij}(t)$, which can be expressed as follows:

$$h_{ij}\ [t|x_i(t)] = \lim_{)60} P_j\ [t =< T =< t+ \qquad (1)$$

where T is a random variable denoting duration in state j (= 1 or 2), and x(t) is the set of covariates that affect the rate, evaluated at time t. The equation is an instantaneous transition rate. It expresses the probability of leaving state j (e.g., employment) after duration t in that state but before duration t+t, given the covariates in x(t) and given that the woman was in state j at time t (where t, in this study, measures the number of weeks spent in the state and t equals one week, a unit time).

The hazard rate of transition, $h_{ij}(t)$, can be parameterized to depend on the vector of time-invariant and time-varying covariates.[13] That is, the hazard rate of exiting state j can be expressed as

$$h_{ij}\ (t;\quad = h_0\ (t)\ \exp(\qquad (2)$$

where with a vector of time-independent(X1) and of time-dependent(X2) variables depending on the state currently occupied, and 1 , a vector of unknown parameters to be estimated. The hazard rate to be estimated then is based on the conditional distribution of exit time from a state given the amount of time spent in the state in the current spell.

While most of the individuals in our sample experience multiple spells of employment and nonemployment during the observational period, we pool them into one sample and, in the process, our model becomes a multi-episode (spell) model. Estimation of the hazard rates upon multiple spells need to be conditioned on the partial or the entire history of the process (Blossfeld, Hamerle, and Mayer 1989). In each model that we estimate, thus, we include the duration and the number of past spells to capture dependence of the hazard rate on past work history.

Equation (2) can be easily extended to include the past history variables into the extant set of covariates as follows:

$$h_{ij}\ (t; X\ = h_0\ (t)\ \exp(X \qquad (3)$$

where H_{k-1} refers to the vector of the past history variables measured up to the (k-1)th spell and , their parameters to be estimated.

Duration dependency or the time structure of hazard rate can be specified in a variety of ways depending on the assumption and the choice of the underlying distribution of the baseline hazard function, i.e., $h_0(t)$. In this study, we adopt a most general specification of duration dependency using Box-Cox transformation of time. The strategy adopted here is to write

$$h_0(t) = \exp\{ \qquad (4)$$

where $_{1j}$, are coefficients for duration, i.e., t. Duration dependence is captured by the two terms $(t^{81}\ -1)/_{1j}$ and $(t^{82}\ -1)/$. This formulation of the time structure of the hazard rate is very general and it contains, as special cases, most of the commonly used hazard functions (see Flinn and Heckman 1982). For example, if we set $_1 = 0$ and $= 0$, we obtain the Weibull hazard

rate

$$h_0(t) = \exp(\qquad (5)$$

where the hazard is a power function of time and where it monotonically increases, is constant, and decreases as $_1$ is greater than, equal to, or less than 1. The Weibull function includes, as can be seen, the exponential (constant) hazard function as a special case where $_1 = 1$. Further, if we set $_1 = 1$ and $= 0$ in equation (4), then we obtain the Gompertz hazard where the hazard declines, is constant, or rises as $_1$ is less than, equal to, or greater than 0. By specifying a general duration dependency model, we can test competing models of duration dependence (e.g., Weibull, Gompertz, etc.) by using classical hypothesis-testing procedures. Notice that the specific models are nested within our general model for duration dependence (see also Yi, Honore, and Walker 1987).

A spurious duration dependence can arise from unobserved individual heterogeneity that is constant over time and that "true" duration dependence can be identified only when the unobserved heterogeneity is properly controlled (Heckman and Borjas 1980; Lancaster 1992). Empirical difficulties arise, however, when we try to distinguish the effect of individual heterogeneity from that of duration dependence. The issue is to distinguish between "true" and "spurious" duration dependence. A commonly adopted approach is to follow Heckman and Singer (1984) and to control for unobserved heterogeneity in a nonparametric way (Trussell and Richards 1985). Assume that we have j homogeneous sub-groups in the sample. The hazard, then, for individual i in group j can be expressed as:

$$h_{ij}(t) = h_0(t) \exp(\quad (t) + \qquad + c_j) \qquad (6)$$

where c_i refers to the factor loading (for the unobserved heterogeneity) for the specific group to which the individual i belongs and where θ represents the term for unobserved heterogeneity.[14] The number of homogeneous groups in the sample, which is unknown but assumed to be a step function, is to be determined empirically. The CTM (Yi, Honore, and Walker 1987) program that we use for our model estimation provides Heckman and Singer (1984) nonparametric maximum likelihood estimator (NPMLE) of the unobserved heterogeneity component.[15]

EMPIRICAL RESULTS

A. Transitions from Employment to Nonemployment

Figure 1 presents Kaplan-Meier estimates of survivorship in employment state. The time-path of survivorship does not show a wide difference between whites and blacks. But white women are slightly slower in exiting the employment state than black women are. The week numbers by which a first, second, and third quartile of the sample members exit the state are 11, 28, and 74 for whites, and 10, 24, and 62 weeks for blacks. That is, 50% of the white sample exits the state by the 28th week of employment, while 50% of the black sample does so by the 24th week in the same state.

Tables 4 and 5 present the results from our hazard model estimates for exits from employment for whites and for blacks, respectively. Each successive model is hierarchically nested in the following model so that we can perform likelihood ratio tests for each additional set of independent variables. Table 6 presents model fit statistics.

Age and Life-Stage Variation in Employment Stability

The parameter estimates of Model 1 indicate that age has a stabilizing effect on young women's employment.[16] With family status held constant, women in the older age category are less likely to exit employment than women in the younger age category.[17] The estimated effects of the age categories are large and significant. For example, white women in the oldest age

category (30-34) are only .60 times (=exp(-.515)) as likely to exit employment as women in the omitted age category (20-24), whereas women in the youngest age category (16-19) are about 1.30 times (=exp(0.260)) as likely to exit employment as those in the omitted category. The corresponding figures for black women are .75 (=exp(-.283)) and 1.54 (=exp(.430)). The large positive effect of the youngest age category (16-19) on exit rates attests to the difficulty that early school-leavers have in securing stable employment in the labor market (Clark and Summers 1982), a situation more pronounced among blacks.

The stabilizing effect of age, on the other hand, is much weaker for blacks than it is for whites. Except for the large positive effect of the youngest age category for blacks, all age effect parameters are much smaller for blacks compared to those for whites. The weaker association of age with employment stability among black women may be because of their high rates of first birth at relatively younger ages. As stated earlier, an early transition to motherhood may be detrimental to youth's accumulating job skills and developing stable work careers. Or frequent movement in and out of the labor force by black youth may prevent their early work careers from developing as they age in the labor market (Holzer 1986; Ballen and Freeman 1986). The result will be a weaker stabilizing effect of age on their employment.

The stabilizing effect of age on young women's employment exists independently of the level of education attained, as Model 3 shows. When education is controlled along with other human capital variables, the age effect parameters are in general reduced for both whites and blacks, but they are still large and significant at $\alpha = .05$ level. The results thus support the posited age stability hypothesis on youth's employment. While the hypothesis has in most cases been tested on male data, the results based on our female data show that young women enjoy the same age stability in employment as observed for young men in previous studies (e.g., Diprete 1981; Mare et al. 1984; Shavit et al. 1990).

The effect of age on exits from employment, however, shows a quite different racial pattern when past labor market experience is controlled (Model 4). For whites, the age effect parameters are further reduced but still sizable and significant. For blacks, however, the parameters for the oldest two age categories (AGE25-29 and AGE30-34) become insignificant. That is, except for the significant positive effect of the youngest age category, aging has no effect on black women's rates of exit from employment when cumulative labor market experience is controlled. The results, then, imply that there exists an independent stabilizing effect of age on employment apart from labor market experience among whites but that, among blacks, the age effect is largely a function of cumulative labor market experience.

Successive family stages are associated with increasing rates of transition out of employment. The estimated effects of the life-stage variables in Model 1 are large and significant. The omitted category here is the stage before first marriage and first birth. Women in each subsequent stage are more likely to exit from employment than women in the previous stage; this result reflects the expected depressing effects of first marriage and of first birth on young women's attachment to employment. As expected, the negative effect is largest at the last stage (i.e., married with children present).[18] We also note that family transition effects are much weaker among blacks than among whites, as can be seen by comparing the parameter estimates in Tables 2 and 3. With age at the start of the spell controlled, first marriage has no significant effect on exits from employment among blacks (b=.081, s.e.=.054), whereas it has a significant effect among whites (b=.276, s.e.=.027) in Model 1. While first birth after first marriage (stage 4) increases the rate of exit from employment by about 1.26 times (=exp(.507-.276)) among whites, among blacks it increases the rate by only 1.11 times (=exp(.199-.081)) over the rate for married women before first birth (stage 2).

The results then show that black women's rates of exit from employment are much less

affected by family transition events than white women's rates. This racial pattern of the family transition effect on the hazard rate holds even when other individual characteristics are controlled in the extended models. These results are consistent with findings from our life table analysis and with previous studies that document the less constraining effects of marriage and/or childbirth on employment probabilities among black women as compared to white women (e.g., Cain 1966; Sweet 1973). Overall, age is positively associated with women's employment, whereas family transitions or events are negatively associated with women's employment, but both in varying degrees between whites and blacks. The net result will be the offsetting effects of age and family transition on women's employment stability.

The Effects of Education, Ability, and Attitudes

Education, as expected, strongly affects the rates of exit from employment for young women. While high school dropouts are the most likely to exit employment, successively higher educational categories are associated with gradually decreasing relative rates of exit from employment. We also observe that the effect of education is stronger for blacks than for whites. Rate of exit from employment decreases by a factor of .83, .79, and .76 for whites and by a factor of .78, .64 and .50 for blacks as educational attainment goes up one level higher relative to high school dropouts (Model 4). Model 4 shows that one's mental ability has an expected negative effect on the rate of exit from employment even with one's family background, education, and past work experiences controlled. A standard deviation increase in ASVAB test score decreases the likelihood of exit from employment by about 1.13 times (=1/exp(-.12)) for both whites and blacks.

With regard to the effects of sex-role attitudes and preferences for market work, we expected that women who plan to work at age 35 are less likely to exit employment, whereas women whose sex-role attitudes are more family-oriented are more likely to exit employment.

Model 4 shows a positive effect of FAMATT and a negative effect of WORK35, thus conforming to our expectation. But both effects are not statistically significant, implying that, once other individual characteristics are controlled, one's attitudes and preferences have no effect on young women's exits from employment.[19]

Own Wage and Husband's Income Effect

Women's wage at the current job, as expected, exerts a strong negative effect on exits from employment. According to our model estimates (Model 6), a 100% change in the wage rate decreases the hazard rate by a factor of .58 (= exp(-.533) (whites) or .57 (=exp(-.567) (blacks). As the wage constitutes the direct opportunity cost of not working, the higher the opportunity cost, the less likely a woman is to exit employment. One unexpected result relates to the effect of husband's income on wife's rate of exit from employment. A husband's income is assumed to index the family's ability to pay the costs of not working or to buy out his wife's time at work for household production and for children. As such, an increase in husband's income is expected to increase his wife's likelihood of exit from employment *ceteris paribus*. But our results show a small but significant negative effect of husband's income on employment exits. Felmlee (1984), based on NLS-Young Women data, finds a similar result for the husband's income effect from her analysis of transition rates between employment and nonemployment.

Two possible explanations can be proposed. First, a "relative income hypothesis" (e.g., Duesenberry 1949) suggests that a woman's labor supply decision may be harnessed more to the previously established standard of living and consumption than to the absolute level of the husband's income. If this is true, then a woman might remain in the labor force in an attempt to maintain a previously established higher level of family income. Second, while previous findings on the negative effect of husband's income on women's supply of labor are based on mature women, young women's labor supply function might be different from that of older women. The

husband's income effect might have changed for young women of recent cohort so that their attachments to the labor market are not as affected by the level of husband's income as they were previously. If a woman's work career is important for her, then her husband's higher level income may not necessarily induce her to leave the labor force (Long and Jones 1980).

The Effects of Past Work History and Experience

We hypothesized that the greater a woman's number of previous spells of employment, the less stable her past work history, and the more likely she exits employment again (*occurrence dependence)*.[20] It is also hypothesized that the longer a woman's cumulated duration of past spells of employment, the more experienced and committed she is to work, and the less likely she is to exit employment (*lagged duration dependence*).

Model estimates in Tables 4 and 5 show that there is significant occurrence and lagged duration dependence in young women's rate of exit from employment. That is, the greater a woman's number of past spells of employment, the more likely she is to exit current employment, and the longer the cumulated duration of her past spells of employment, the less likely she is to exit current employment. In Model 4, one additional past spell of employment increases the rate of exit by 1.11 (=exp(.10), whereas a 100-week increase in past work experience decreases the hazard by a factor of .73 (=exp(-.308) for whites and by a factor of .64 (=exp(-.437) for blacks. Introduction of other relevant factors in Models 5 to 7 does reduce the effects of past work experience to some extent, but they remain significant. Especially robust and strong is the effect of cumulated past work experience (TPDURM1) for blacks. In Model 7, which controls for other structural factors, the size of the parameter is only slightly reduced from b=-.437 to b=-.422.

In sum, there is strong evidence for state dependence in young women's exits from employment: the rate of exit from employment or the duration of current employment depends on the *number* and the *length* of past spells of employment. Observed state dependence, however,

does not necessarily imply a "true" effect of past work experience on women's labor market behavior. It could be arising from temporally correlated unobservable characteristics of individuals, i.e., *heterogeneity*, that influence their probability of experiencing nonemployment (Heckman and Borjas 1980). In that case, the observed state dependence is called "spurious" state dependence. We address the issue in Model 8 by introducing individual heterogeneity into the model.

The Occupational Characteristics of the Current Job

Controlling for the job characteristics in Model 7 induces a relatively large reduction in the effects of most human capital variables. The parameter estimates for educational categories, especially, become much smaller than those in Model 4 or 5. Of particular interest is the change in the parameter for the last category, college education. Once job characteristics are controlled, a large negative effect of college education (b = -.416) is reduced to an insignificant negative one (b = -.066). One probable explanation is that women with higher education are more likely to be in occupations (professional and managerial, for example) in which stable employment is the norm (Reskin and Hartman 1986) than are women with lower education. If so, the observed positive effect of education on the duration of employment should be due, in large part, to the positive association between education and the prestige category of the occupation in which the woman is working.[21]

The effects of occupational categories are large and significant. Women in the managerial and professional occupations — the omitted category — are least likely to exit, whereas women in the manufacturing and service occupations are the most likely to exit employment. With wage at the current occupation controlled in Model 7, the occupational categories should index non-monetary aspects of the occupation. The result, then, suggests that the broad occupational categories differ in those non-monetary factors related to women's probability of remaining

employed. Women in the public sector and unionized jobs are also significantly less likely to exit employment than women in the private sector and non-unionized jobs.

As a summary presentation of the empirical results, we compute predicted hazard rates of exit from employment. Table 7 presents the predicted rates based on Model 7 for whites and blacks by family status and by education. The predicted rates are evaluated at the race-specific mean values of the covariates with duration (t) set to 26 weeks. We also present black-white differences in the predicted rates by family status and by educational level.

Duration Dependence and Unobserved Heterogeneity

The parameter estimates for duration dependence in our Weibull hazard models (γ) are all significantly different from 1.0, indicating that there is strong negative duration dependence in rates of exit from employment. That is, the longer the current spell of employment, the less likely it is that a young woman will exit employment. The observed duration dependence could be a result of observed and unobserved heterogeneity among individuals. In Models 1 through 7, the covariates included represent the "observed" individual heterogeneity that needs to be controlled to account for the observed duration dependence in the baseline model. With more covariates controlled in each succeeding model, the parameter for duration dependence, in fact, gradually decreases in size; as can be seen in Model 7, however, the duration dependence parameter remains significant even after all relevant factors are controlled. The observed duration dependence may imply that the longer the duration of current employment, the more the woman becomes invested in and committed to the job, and, thus, the less likely it is that she will leave the job.

However, an alternative explanation for the observed duration dependence should also be considered: individuals may differ in certain unmeasured variables that influence their labor market behavior, and the observed duration dependence might be a consequence of the

"unobserved heterogeneity" that, if not properly controlled, tends to generate "spurious" duration dependence (Heckman and Borjas 1980). To address the issue, Model 8 extends Model 7 (the full model) by incorporating the Heckman-Singer non-parametric control for unobserved heterogeneity.

With one point of support, the heterogeneity term greatly increases the explanatory power of the model over the full model (χ^2 = 258.014 for blacks, = 454.052 for whites with d.f.= 2).[22] The parameter estimates in Model 8, in fact, show that the observed duration dependence in the rate of exit from employment is an artifact of unobserved heterogeneity. The duration parameter becomes statistically insignificant for both whites and blacks once unobserved heterogeneity is properly corrected in Model 9 (whites: b= -.016, s.e. = .012; blacks: b = -.030, s.e. = .016). This result for young women is consistent with Flinn and Heckman's (1982) finding on young men's employment to nonemployment transitions. We find that unobserved heterogeneity is an important determinant of the rate of exit from employment for young women. The factor loading for the heterogeneity term is estimated to be large and significant. The model assumes that there are two homogeneous groups: one with low risk and another with high risk of exiting employment. The proportion in the high risk group is estimated to be about 43% among whites and 53% among blacks. The hazard rate for the high risk group is 3.18 (=exp(1.158)) and 3.29 (=exp(1.193) times higher than the rate for the low risk group among whites and blacks respectively. Thus, according to our model estimates, the rate of exit from employment among young women is strongly affected by unobserved individual characteristics as well.

The introduction of heterogeneity results in a dramatic change in the estimated effects of the past spells of employment. The coefficients for TPDURM1 and TPDURM2 become statistically insignificant for whites (b =.029, s.e.=.04) and are greatly reduced, even though still significant, for blacks (b = -.183, s.e.=.058) (Compare Model 7 and Model 8).[23] In contrast, the

parameter estimates for most of the other covariates in the model become larger with the inclusion of heterogeneity.

First, these results inform us that the cumulative duration of past spells (of employment) is a good proxy for unobserved heterogeneity among young women as it relates to their labor market behavior. Second, the results suggest that the structural relationship between past and current spells of employment (i.e., state dependence) is to a large extent due to the unobserved heterogeneity among individuals. For blacks, however, there still exists evidence for "true" state dependence in their rates of exit from employment that cannot be explained away with unobserved heterogeneity. The result implies that black women's labor market behavior tends to be altered by their past experience (spells) of employment in such a way that the longer the duration of past spells of employment, the longer the duration of their current employment. One possible reason for such temporal dependence in black women's employment durations might be, as Heckman and Willis (1977) have suggested, the fixed costs of reentering the labor force (or employment) that will be incurred once they leave it are higher for them than for their white counterparts.

B. Transitions from Nonemployment to Employment

Figure 2 illustrates Kaplan-Meier estimates of survivorship in nonemployment state. Unlike exits from employment, the survivorship in nonemployment shows a clear racial differential. The figure shows that blacks are much slower than whites in exiting from nonemployment. The first, second, and third quartiles are 3, 9, and 27 weeks for whites, and 5, 18, and 47 weeks for blacks. That is, 50% of white women entering nonemployment exit the state to return to employment by their 9th week in that state, whereas blacks do so by their 18th week in the state. More than a quarter of black women stay in thenonemployment for more than 47 weeks once they enter, whereas their white counterparts do so only for 27 weeks.

Tables 8 through 9 present results from our hazard model estimates of the rate of exit from nonemployment, i.e., the process of (re)entering employment for whites and blacks. Model specifications follow basically the same pattern as those for exits from employment. Table 10 presents model fit statistics for Models 1 through 8 for whites and blacks.

Age Pattern and Life-Cycle Variations in the Rate of Entering Employment.

The rate of entering employment varies significantly with women's age and life-stage categories. Age is positively associated and each succeeding life-stage is negatively associated with the probability of (re)entering employment. Women in the youngest category (16-19) are the least likely to be (re)employed, whereas those in the oldest category are the most likely to be employed once not employed. Model 1 shows that, relative to the reference group (20-24), women in the youngest group are 0.71 (= exp(-.338)) times (whites) and .59 (=exp(-.523)) times (blacks) as likely to be employed with current family status controlled. The result can be interpreted either as an indication of the difficulty that teen age workers face in finding a "decent" job, or as an indication of their "uncommitted" and unstable work behavior (Feldstein and Ellwood 1982; Osterman 1980). Under the same conditions, women in the oldest category, on the other hand, are 1.33 (whites) and 1.23 (blacks) times more likely to enter employment at each point in time. The results, then, do not support our hypothesis of bidirectional stability in labor market transition: aging is positively associated with stability in employment but not with stability in nonemployment.

Tables 8 and 9 show that family transitions are, as expected, negatively and strongly associated with the rate of entering employment. Negative effects of the family transition events on the rate of (re)*entering* employment are matched with their positive effects on the rate of *exiting* employment. As was the case in exits from employment, family transitions show a significantly different racial pattern in their effects on employment: the negative effects of first

marriage and/or first birth on women's employment are much weaker for blacks than for whites. Model 1, for example, shows that, among whites, married women are .70 (if no child present) and .42 (if child present) times as likely to exit nonemployment as never-married women in the same age and educational category. Among blacks, however, married women are .84 (if no child present) and .75 (if child present) times as likely to enter employment as never-married women with age and educational level controlled.

First childbirth doesn't make much difference for the rate of *married* women entering employment among blacks, whereas it dearly does for white women; with the arrival of the first child, as the parameter estimates in Model 1 reveal, the likelihood of entering employment gets reduced by only 6% among blacks, whereas it gets reduced by almost 33% among whites.[24] But note that the effect of first birth among blacks strongly depends on women's marital status. First birth among unmarried women has a much larger negative effect on employment than among married women. Unmarried women with their first child born have the lowest rate of (re)entering employment from nonemployment even when we control for all the other factors (e.g., Model 7). Their rate is about .67 times (=exp(-.405) the rate for unmarried women without children.

The Effects of Education, Ability, and Attitudes

First, young women's sex-role attitudes (FAMATT) have a very weak negative effect on the rate of returning to employment once other human capital and family background variables are controlled (Model 4). Early work plan (WORK35), however, does not have a significant effect on the rate of returning to employment for either whites or blacks. As expected, women with more family-oriented attitudes are slightly less likely to enter employment than women with less family-oriented attitudes. One's mental ability and educational attainment positively and significantly affect the rate of returning to employment; education, in particular, has a strong positive effect on the rate with age and family status, family background, and work history held

constant (Model 4). The pattern of education effect is quite regular: each successively higher educational category is associated with gradually increasing rates of exit from nonemployment. The education effect is also quite robust; controlling for local labor market conditions and the characteristics of the previous job does not much reduce the magnitude of the effect (Models 5 to 7), which is different from the case for exits from employment. Given that education closely represents the "permanent" wage level that a woman can command once she works and, thus, the opportunity cost of not working, the result supports the hypothesis that the higher the opportunity costs of not working, the higher the rate of returning to employment from nonemployment. Note that this result holds even with previous wage rate, husband's income (Model 5), and the occupational characteristics of the previous job held constant (Model 7).

In comparing whites and blacks, we observe that the effects of human capital variables (i.e., education and mental ability) are larger for blacks than for whites (Model 4). The effect of labor market experience, which can be also considered as part of human capital, is, in contrast, much smaller for blacks (b = -.188, s.e.=.043) than for whites (b = -.389, s.e.=.036) as shown in Model 4. These results seem to indicate that the chances for black women in entering employment are more affected by what they bring to the labor market (i.e., education and ability) than by what they achieved in the labor market (i.e., work experience).

The Effects of Past Work History and Experience

The rate of returning to employment is negatively affected by the cumulative duration of past spells of nonemployment (i.e., TPDURN1 and TPDURN2) and positively affected by the number of past spells of nonemployment. On the one hand, the longer the duration of past spells of nonemployment, the lower the rate of moving into employment; on the other hand, the greater the number of past spells of nonemployment, the higher the rate of returning to employment. The strong negative effect of the cumulated duration of the past spells of nonemployment, i.e., lagged

duration dependence, may be, as human capitalists (e.g., Mincer and Polachek 1974; Polachek 1979) suggest, a result of the depreciation of human capital while a woman is out of the labor force. Or it could reflect the effect of unobserved heterogeneity as it is indexed by the cumulative duration of past spells. The results in Model 8 support our alternative explanation; that is, with unobserved heterogeneity properly controlled, the parameter estimates for the past spells of nonemployment become greatly reduced and statistically insignificant for both whites and blacks. As with transitions from employment to nonemployment, the cumulated duration of past spells (of nonemployment) is a good proxy for unobserved heterogeneity for transitions from nonemployment to employment.

We expected that a casual work history with many employment-nonemployment transitions may be regarded by employers as a negative indicator of the woman's work habits and thus will exert a negative effect on the probability of becoming employed. The estimated positive effect of the number of past spells of nonemployment seems to contradict our expectation. It could be, however, a result of a small proportion of quite mobile women in the sample making a disproportionate number of transitions into and out of employment. Our conjecture seems to be supported by Model 9, where, with unobserved heterogeneity controlled, the coefficient changes its sign into negative, even though the effect parameter is not statistically significant for both whites and blacks.

Own Wage and Husband's Income Effect

Own wage at the previous job is positively associated with the rate of returning to employment even when all the other factors are controlled (Models 5-7). To the extent that the previous wage represents the "potential" wage rate and, thus, the opportunity cost of not working, the result supports the hypothesis: the higher the opportunity costs of not working, the more likely the woman is to work in the labor market. With education, ability, and past work history

along with other factors controlled (Model 5), a 100% increase in own wage rate is associated with 8% (=exp(.083)) and 18% (=exp(.168)) increases in the rate of returning to employment for whites and blacks respectively. Thus, the "pulling" effect of one's market wage potential is somewhat stronger among blacks than among whites.

Past studies find that women with husbands who earn higher incomes are less likely to be in the labor force at any given point in time; that is, there is a negative association between husband's income and wife's participation in market work (Bowen and Finegan 1969; Cain 1966; Sweet 1973). The parameter estimates in Model 5, however, do not support the hypothesis. For whites, the estimated effect of husband's income is positive and insignificant (b=.003, s.e.=.005). For blacks, the estimated effect is positive and significant (b=.023, s.e.=.007). For whites, husband's income does not significantly affect wife's probability of employment, but for blacks, husband's income *positively* affects wife's probability of employment. Thus, among blacks but not among whites, the "relative income hypothesis" seems to be supported by the results. The result is also consistent, in a limited sense, with what Mott and Shapiro (1978) have found on NLS young women (NLSYW): among black women after the first birth, the highest participation (in the labor force) was by the high-income group.[25] In general, young women's participation in market work seems to be more responsive to their own market wage than to their husbands' income (Bianchi and Spain 1986).

The results, along with findings in past studies (e.g., Felmlee 1984; Mott and Shapiro 1978), lead us to suspect that the traditional negative relationship between husband's income and women's participation in market work has substantially weakened among younger cohorts. In one respect, the weakened relationship between husband's income and women's decision to participate in market work can be interpreted as reflecting increasing social and economic incentives for women's own work career and economic independence, which seems to arise from well-

documented historical changes in the institution of family (e.g., increasing risk of marital breakup) (Bumpass 1990). In another respect, the weakened relationship might be a result of the economic recess of the 1980's, during which an historically higher proportion of married women participated in market work to supplement their husbands' incomes (e.g., Sweet 1973).

The Occupational Characteristics of the Previous Job

Results in Model 7 show that the occupational characteristics of a woman's previous job influence the rate of returning to employment, even if their theoretical implications are not so clear. If the previous job was in occupations other than managerial or professional (the referenced category), then, in general, the hazard rate of returning to employment is significantly lower than is the case when the occupation was managerial or professional. The parameter estimates for the second (clerical and sales) and the fourth (service) occupational categories are all negative and statistically significant. But for both groups, the negative effect associated with the third category (i.e., laborer) is not significant at $\alpha = .05$ level. Among whites, women whose previous occupations were clerical or sales have the lowest rate of returning to employment, while, among blacks, women in service occupations have the lowest rate (i.e., about 20% lower than the rate for managerial and professional occupations). Given that Model 7 controls all the other relevant individual and structural factors, the estimated significance of the occupational category of the previous job should be considered as a noteworthy empirical regularity that is associated with young women's return to employment. Besides the occupational category, the sector and union status of the previous job also significantly affects the hazard rate of returning to employment. If the previous job was in the public sector and/or unionized, then the rate is also significantly greater than otherwise. In summary, we now compute predicted rates of transition from nonemployment to employment based on Model 7. Table 11 presents the predicted rates of transition by family status and by education for whites and blacks. The predicted rates are

computed in the same way as for exits from employment.

Duration Dependence and Unobserved Heterogeneity

For exits from employment, we found that observed duration dependence in the rate of exit can be accounted for by unobserved heterogeneity. The results for Model 8 show that the rate of exit from nonemployment depends on duration: the longer the woman stays nonemployed, the lower the rate of exit from nonemployment. This duration dependence — unlike the case for the exits from employment to nonemployment — is not an artifact of unobserved heterogeneity. With the unobserved heterogeneity controlled, the duration dependence parameter is reduced by about half but is still significantly different from 0 (b =-.130, s.e. = .008 for whites; b = -.106, s.e. = .014 for blacks).[26] The results, then, suggest that for exits from *nonemployment*, unobserved heterogeneity is an important factor affecting the hazard rate; but there exists, at the same time, a significant duration dependence in the rate of exiting nonemployment state.

The factor loading for unobserved heterogeneity estimated with one point of support is large and significant. The low-risk group — those who are less likely to exit — has a hazard rate 2.94 (=1/exp(-1.08)) times lower than that of the high-risk group. The estimated proportions of the low- and high-risk groups are about .32 and .68 in the white sample and about .47 and 53. in the black sample.

SUMMARY AND CONCLUSION

Young women's transition between employment and nonemployment is strongly affected by their age and family status. The results from the multivariate analysis show that young women become more stable in their employment behavior as they age; conditional on family stage, they are less likely to exit and more likely to enter employment as they age over the early life course even when education is controlled. But the age stability in employment is found to be much weaker among blacks than among whites. First marriage and first childbirth each significantly

increases the rate of exit from employment and significantly decreases the rate of entry into employment. But again, black women's labor market transitions are much less affected by family transition events as compared to white women's — a result consistent with past findings (e.g. Cain 1966; Sweet 1973).

While individuals' socioeconomic backgrounds affect their labor market transitions only marginally, individual human capital variables (i.e., education and work experience) strongly affect young women's labor market transitions: the more educated and/or the more experienced, the less likely to leave employment and the more likely to return to employment. Young women's labor market transitions are also strongly affected by their previous wage level; the higher the wage rate at the previous job, the less likely the woman is to leave employment and the more likely to return to employment from nonemployment. The strong effect of previous wage rate indicates that young women's labor market behavior is quite responsive to the economic opportunity in the labor market.

The results from our event history analyses show that young women's labor market transitions are time-structured. First, the rate of exit from employment or nonemployment is dependent on the duration of current spell: the longer the duration of current employment (or nonemployment), the less likely is the event that the woman will exit employment (or nonemployment). Second, the rate of transitions between employment and nonemployment is dependent on the cumulated duration of the past spells of employment or nonemployment. The current and lagged duration dependence in young women's labor market transitions, however, is due, in large part, to unobserved heterogeneity among individuals. For exits from employment, the observed duration dependence is completely explained by unobserved heterogeneity.

For exits from nonemployment, on the other hand, the duration effect is statistically independent of the effect of unobserved heterogeneity: the longer the duration of current

nonemployment spell, the less likely is the event that the woman will return to employment. These findings on the time structure of the rates of transitions between employment and nonemployment question the conventional discrete-time or static cross-sectional approaches to women's labor market transitions that implicitly rely on the Markovian assumption on the processes (Flinn and Heckman 1982). The transition from employment to nonemployment is a nonMarkovian process because of unobserved heterogeneity — a mover-stayer problem; the transition from nonemployment to employment is a nonMarkovian because of structural duration dependence.

However it should be recognized that the theoretical implication of the "unobserved heterogeneity" factor in our models of labor market transitions is somewhat ambiguous. With the measures of individual's mental ability, work-related attitudes, and past work history — the variables often used to proxy unobserved individual characteristics — included in the model, the unobserved heterogeneity factor in our hazard rate models may serve mainly a statistical function of separating "true" from "spurious" state dependence. That is, we want to know whether early labor market experience is doing something to a person (i.e., state dependence) or telling us something about the person (i.e., heterogeneity) (Corcoran 1982). The mover-stayer problem, if not properly controlled, could result in spurious state dependence in hazard rate models (Heckman and Singer 1984; Blossfeld and Hamerle 1990; Lancaster 1992). Our model estimates, in fact, show that there exist two heterogeneous groups in the sample in terms of the hazard rate of transitions between employment and nonemployment — a low-risk group and a high-risk group.

The duration dependence in exits from nonemployment, on the other hand, may imply a couple of different underlying processes. First, the time out of the labor force may induce a change in women's behavior — that is, women's job skills may become depreciated and/or

women, while being out of the labor force, may become more home-work oriented and less market-work oriented. Second, there may exist structural constraints on the employment chances of women who are returning to work after a long spell of non-work (e.g., stereotyping by employers on the basis of early work behavior). Whatever the theoretical interpretation of the observed state dependence, the significance of past work history in our models of labor market transitions carries an important policy implication: even with a widened opportunity of paid employment for women — through equal opportunity and affirmative action policies — past work experience is an important determinant of employment chances in the labor market.

This study also documents the importance of the structural factors in determining individuals' rates of entry into and exit from employment. The occupational category, sector, and union status of the current or previous job are all important determinants of individuals' rates of transition between employment and nonemployment. For example, we find that women employed in low-prestige occupational categories such as service and manufacturing are far more likely to exit employment than women employed in professional and managerial occupations, even when individual differences in the family background, human capital, and prior work experiences are taken into account.

The results point to the importance of occupational choice early in the work career of a women (see also Goldin 1983). Moreover, drawing on the multivariate results, we have shown that a substantial portion of the effect of education on the transition rates can be explained by the close correlation between one's education and occupational position and the particular sector of the labor market. The results, in sum, then imply that the opportunity structure embedded in the sector of the labor market and in the occupational category that women enter exerts a direct and an indirect effect on women's labor market transitions and work attachment. Women's commitment or attachment to market work is significantly constrained not only by their family

obligations but also by the opportunity structure of the labor market that young women enter.

Notes

1. We define a woman to be employed if she is gainfully employed either fulltime or parttime, and we define a woman to be nonemployed if she is either unemployed or out of the labor force. The reason we group the unemployed and those out of the labor force together into the nonemployed is that, as Clark and Summers (1982) have noted, during the transition period from school to early adulthood that we cover in this study, the distinction between unemployment and being out of the labor force is questionable and that most persons currently not working can be viewed as nonemployed. This will be discussed in detail in the data section.

2. Past studies mostly relied on unistate or unidirectional transition from the origin to the destination state, but few looked at bidirectional transitions between multistates. To fully capture the dynamic process, however, we need to look at the transitions in a multistate framework (Schoen 1988b).

3. Although the presence of children typically constrains women's labor force activities, the constraining effect of children may differ between whites and blacks (Sweet 1973: ch. 4; Wallace 1980: 34-36). Using the 1960's data, Bowen and Finegan (1969) and Cain (1966) found that black wives tended to participate in the labor force at a higher rate than white wives even when their children were under school age. Recently, however, there has been a significant increase in labor force participation among white mothers with young children (Blau and Ferber 1986; Goldin 1983; Smith and Ward 1985; Wallace 1980). Thus, we expect a new pattern of racial differences in female labor supply to have emerged over the last two decades.

4. We recognize here that the processes of entry into and exit from employment also involve involuntary processes such as structural constraints on finding a job, lay-offs, etc. For example, the probability of entering employment is a product of the probability of entering the labor force and that of finding a job, while exiting employment could be a result either of voluntary withdrawal or of involuntary separation from the job.

5. Because our sample members are mostly in their 20s, the number and ages of children would not show much variation. In most cases, the child in the family would be the first child. Thus, our concern about women's family status is restricted to their first birth status — whether or not they have borne their first child.

6. Economics of occupational sex segregation posits a self-selection of women into those occupations through their rational choice based on their long-term plan for employment (see Polacheck 1973).

7. If linkage with an employer is possible for those weeks but information on gaps within the tenure with an employer is not available, then this labor force status, instead of "working" status, is assigned. To all the other "within-tenure" gaps on which information about work status is available, either "unemployed" or "out of the labor force" status is assigned (see CHRR 1993a:233). Weeks not working with a paid maternity leave are coded in the NLSY as a period "employed," but weeks of unpaid maternity leave are coded as either unemployed or out of the labor force depending on the respondent's job search activity during that period. So, to the extent that education and other individual characteristics are related to the "desirability of employment" that the individual can enjoy (e.g., the provision of paid leave by employers), the effect of those

covariates is overestimated in our transition models.

8. Information on weekly employment status is available for up to 5 jobs held during the previous 12 months. For a full definition of those categories, see CHRR 1993a:sec.23.

9. Working status includes both fulltime and parttime employment. Before 1986 the exclusion for parttime work was 20 hours per week; for 1987 and later, theexclusion for parttime work was ten hours per week.

10. Also, a one-week gap between employments is not treated as a spell of nonemployment but as part of continuous employment. Thus, spells of nonemployment consist of spells of 2 or more weeks not employed.

11. By defining women's labor force status without distinguishing between part-time and full-time work within the employed state, we come to ignore the volume of labor (time) supplied by women to market work, which is anotherimportant dimension of labor force activity. We would argue, however, in defense of our decision, that, for women, whether or not to participate in the labor force is a more important decision than how many hours worked. In most cases, women may first decide on whether or not to work and the decisionon the amount of time to be spent in working may be made on the basis of the availability of work and changing family economic situation (Sweet 1973:38). Furthermore, some economists argue that a woman's decision on participation is functionally independent of the decision on the volume oflabor to be supplied to the labor market.

12. Mental ability (TSCORE) is measuredas the respondent's scaled scores from the ASVAB test administered in the1980 survey. The ASVAB consists of a battery of ten tests that measure knowledge and skill in the 10 areas (see CHRR 1993a:Sec.2.3). Using principal components factor analysis, we turned the 10 scaled test scores into a standardized factor score (mean=0, s.d.=1) for each individual.

Respondent's sex-role attitudes (FAMATT) are measured with the respondent'sanswers to the four questions asked inthe 1979 survey about women's role in the family and work (i.e., family and sex-role attitudes). Respondents were asked if they strongly agreed, agreed, disagreed, or strongly disagreed with the following four statements: (1) a woman's place is in the home, not in the office or shop; (2) a working wife feels moreuseful than one who doesn't hold a job; (3) it is much better for everyone concerned if the man is the achiever outsidethe home and the woman takes care of the home and family; (4) women are much happier if they stay at home and take care of their children. Responses were coded on a five-point scale with "don't' know" responses placed in between the "agree" and "disagree" categories (i.e., coded 3) so that a high score on each question indicates more stereotypical sex-role andfamily attitudes (i.e., less work-oriented). The four attitude variables were subjected to a principal component factor analysis to geta standardized factor score (mean=0, s.d.=1) for each individual, i.e.,FAMATT. The factor has large positive loadings for all four variables (e.g., 0.78, 0.72, 0.76, 0.74 on the 1st, 2nd, 3rd, and the 4th measure respectively).

We measure women's preferences for market work vs. home work using the respondents' expressed long-run plan of work and family career. In 1979, respondents were asked, "What would you like to be doing when you are 35 years old?" Using responses to this question, we

create a dummy index variable, WORK35, taking avalue of 1 if the woman plans to work at age 35 (high preference for market work) and 0 if she prefers to stay at home and to be engaged in some other activity (no or low preference for market work).

13. The specific set of covariates to be included in the model depends on the specific transition under consideration and on the particular stage to which the spell belongs. For example, job characteristic variables for transitions out of employment come from current job, while they come from previous job for transitions out of nonemployment. Also, the husband's income is missing in the models for stages 1 and 4 (i.e., for unmarried women).

14. If two heterogeneous groups are assumed, θ takes discrete values of 0 or 1.

15. The computational form of the NPMLE is a finite mixture. One jointly estimates support points, θ_l, $l = 1,...,L$ and the mass placed on the support points, P_l, where $\sum P_l = 1$. With $L = 1$ support point (i.e., two heterogeneous groups in the sample), for example, we assume that there are two heterogeneous groups: a high risk group and a low risk group in the sample. The estimated factor loading (c) is basically a multiplier of the hazard rate of the low (high) risk group depending on the sign of the factor loading. A duration model estimated by the NPMLE is thus similar to the latent trait model (Yi, Honore, and Walker 1987).

16. Age here, as stated earlirt, is measured as the age at the start of the spell. As such, our age variable indexes the age-stage when the process is initiated. As the process goes on and the spell gets lengthened, the individual obviously also gets older and more mature, and the behavior of the individual might also change. This within-spell age effect is often termed "maturity effect", and is not tapped in our model. But our models explicitly parameterize the effect of duration on employment and nonemployment transitions. Thus, we expect that once the age category is controlled in the model, the effect of duration adequately captures the effect of the within-spell maturation. Note that age at the start of the process plus duration equals the age at the end of the spell.

17. Age is closely related to the progression of young women in the early stages of family formation with which employment and nonemployment probabilities vary considerably. For the net effect of age to be estimated, therefore, we needed to control for family status.

18. Interpretation of the parameter estimates depends on whether rates or durations are considered. Negative effects on rates can be translated into positive effects on duration, and vice versa.

19. The effects of the attitude variables, on the other hand, could differ for exits from nonemployment into employment. Desai and Waite (1991), indeed, find that among young women after first childbirth, long-term work plan significantly increases the rate of return to employment. In the following section, we estimate the effects of the same attitude variables on the rate of return to employment.

20. In a two-state model, the number of previous spells of employment indexes the number of times an individual had experienced nonemployment and the "accident-proneness" of the individual (see, e.g., Heckman and Borjas 1980).

21. Three underlying processes may be involved in the link between occupational prestige and employment stability. Occupations with lower prestige (e.g., service and manufacturing) are in general characterized by unstable employment, low pay rates, and low chances for promotion (Terry 1982).

22. One point of support in the model implies two heterogenous groups in the population in terms of the propensity to exit employment. The estimated cumulative probabilities for the two heterogenous groups in the population are .43 and 1.00 for white sample and .47 and 1.0 for black sample. In estimating the effect of unobserved heterogeneity, the CTM program that we use allows us to control for state-specific heterogeneity at the same time. The "P_j" estimate for state-specific heterogeneity denotes the population proportion that is permanently immobile (see Yi, Honore, and Walker 1987).

23. Also noteworthy is the change in the sign of the coefficient for NSPELLM from positive to negative. At this point, we don't have a decisive explanation for this result -- the negative effect of the number of past employment spells. But the estimated effect is effect is of negligible magnitude.

24. We exponentiate the difference between the coefficient for FAMST4 and that for FAMST2; for whites, .36 = 1 - exp(-.797+.350) and for blacks, .06 = 1 - exp(-.194+.132).

25. Among other groups (e.g., white women), however, they found that other family income is somewhat inversely related to participation in market work (during pregnancy and after the first birth). Our result cannot be directly compared to their result; their dependent variable is participation in the labor force which includes *unemployment*, while our dependent variable is transition to *employment* from nonemployment (unemployment and being out of the labor force).

26. See Flinn and Heckman (1982) for a similar result for young men.

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Table 1. Distribution of Employment Spells by Number and by Race, 1979-1991

	WHITES					BLACKS				
Number of Spells	N	% of Cases	Cumulative % of Cases	% of Spells	Cumulative % of Spells	N	% of Cases	Cumulative % of Cases	% of Spells	Cumulative % of Spells
0	31	1.41		6.39		78	5.48		10.76	
1	177	8.04	9.45	19.86	26.25	150	10.53	16.01	22.27	33.03
2	298	13.53	22.98	18.22	44.47	214	15.03	31.04	18.59	51.62
3	343	15.58	38.56	15.40	59.87	230	16.15	47.19	14.92	66.54
4	328	14.90	53.46	12.23	72.10	216	15.17	62.36	11.21	77.75
5	301	13.67	67.13	9.18	81.28	145	10.18	72.54	8.24	85.99
6	211	9.58	76.71	6.55	87.83	136	9.55	82.09	5.69	91.68
7	181	8.22	84.93	4.54	92.37	105	7.37	89.46	3.55	95.23
8	112	5.09	90.02	2.96	95.33	70	4.92	94.38	2.16	97.39
>= 9	220	10.00	100.00	4.67	100.00	80	5.60	100.00	2.61	100.00
Total N	2202					1424				
Total Spell	19510					11872				

Table 2. Distribution of Non-Employment Spells by Number and by Race, 1979-1991

	WHITES					BLACKS				
Number of Spells	N	% of Cases	Cumulative % of Cases	% of Spells	Cumulative % of Spells	N	% of Cases	Cumulative % of Cases	% of Spells	Cumulative % of Spells
0	182	8.27		8.89		104	7.30		5.31	
1	347	15.76	24.03	21.20	30.09	140	9.83	17.13	20.67	25.98
2	276	12.53	36.56	17.06	47.15	197	13.83	30.96	18.32	44.30
3	264	11.99	48.55	13.70	60.85	196	13.76	44.72	15.46	59.76
4	254	11.53	60.08	11.03	71.88	194	13.62	58.34	12.39	72.15
5	233	10.58	70.66	8.53	80.41	172	12.08	70.42	9.27	81.42
6	189	8.58	79.24	6.26	86.67	117	8.22	78.64	6.47	87.89
7	119	5.40	84.64	4.32	90.99	94	6.60	85.24	4.70	92.59
8	98	4.45	89.09	3.23	94.22	88	6.18	91.42	3.06	95.65
>= 9	240.00	10.91	100.00	5.78	100.00	226.00	8.58	100.00	4.35	100.00
Total N	2202					1424				
Total Spell	19510					11872				

Table 3. Definitions, Means, and Standard Deviations of Variables by Race: NLSY White and Black Women, 1979-1991

Variable		Whites		Blacks	
		Mean **	S.D. *	Mean **	S.D. *
Age and Life Stage					
AGE16-19	= 1 if age at time t is between 16 and 19, 0 otherwise;	0.02		0.02	
AGE20-24	= referenced if age at time t is between 20 and 24;	0.16		0.18	
AGE25-29	= 1 if age at time t is between 20 and 24, 0 otherwise;	0.53		0.50	
AGE30-34	= 1 if age at time t is between 20 and 24, 0 otherwise.	0.31		0.30	
FAMST1	= referenced if before first marriage and before first birth;	0.18		0.16	
FAMST2	= 1 if after first marriage but before first birth, 0 otherwise;	0.19		0.09	
FAMST3	= 1 if before first marriage but after first birth, 0 otherwise;	0.04		0.31	
FAMST4	= 1 if after first marriage and after first birth, 0 otherwise;	0.59		0.44	
Family Socioeconomic Background					
FAED12	= 1 if father's education is >= 12, 0 otherwise;	0.73		0.34	
FAEDMIS	= 1 if father's education is missing, 0 otherwise;	0.07		0.27	
MOED12	= 1 if mother's education is >= 12, 0 otherwise;	0.75		0.41	
BRKFAM	= 1 if not lived with both biological parents, 0 otherwise;	0.20		0.51	
RSOUTH	= 1 if childhood residence was south, 0 otherwise;	0.28		0.60	
NUMSIB	= number of siblings.	3.05	(1.93)	4.81	(1.31)
Human Capital and Attitudes					
FAMATT	= factorized score for sex-role attitutes	-0.03	(.98)	0.07	(1.03)
WORK35	= 1 if plans to work at age 35	0.65		0.80	
TEST SCORE	= factorized score for 10 item ASVAB test	0.32	(.75)	-0.77	(.72)
HGC < 12	= referenced if R's highest grade completed is less than 12;	0.11		0.17	
HGC = 12	= 1 if R's highest grade completed is 12, 0 otherwise;	0.44		0.43	
HGC 13-15	= 1 if R's highest grade completed is between 13 and 15, 0 other	0.21		0.28	
HGC >= 16	= 1 if R's highest grade completed is 16 or higher, 0 otherwise;	0.24		0.12	
Past Work History					
NSPELLM	= number of past spells of employment;	4.70	(2.77)	4.07	(2.63)
NSPELLN	= number of past spells of nonemployment;	4.16	(3.19)	4.27	(2.89)
TPDURM1	= total duration of past spells of employment / 100;	2.13	(1.53)	1.57	(1.44)
TPDURM2	= TPDURM1 squared;	6.85	(7.91)	4.53	(6.73)
TPDURN1	= total duration of past spells of non-employment / 100;	0.89	(1.19)	1.46	(1.49)
TPDURN2	= TPDURN1 squared;	2.12	(5.03)	4.37	(6.99)

(continued)

Table 3. (continued) Definitions, Means, and Standard Deviations of Variables by Race: NLSY White and Black Women, 1979-1991

Variable		Whites		Blacks	
		Mean **	S.D. *	Mean **	S.D. *
Own Wage and Economic Need of the Family					
LWAGE	= logarithm of R's hourly wage rate	1.75	(.59)	1.56	(.46)
LSPINC	= logarithm of the husband's income in last year / 100	9.31	(1.91)	7.58	(2.19)
Residential and Local Labor Market Conditions					
NON-SMSA	= referenced if current residence is non-SMSA	0.31		0.33	
SMSNC	= 1 if current residence is non-central city of SMSA, 0 otherwise;	0.61		0.53	
SMSCT	= 1 if current residence is central city of SMSA, 0 otherwise.	0.08		0.24	
URATE1	= referenced if local unemployment rate is below 3.0%;	0.47		0.54	
URATE2	= 1 if local unemployment rate is between 3.0 and 5.9%, 0 otherwise;	0.36		0.33	
URATE3	= 1 if local unemployment rate is between 6.0 and 8.9%, 0 otherwise;	0.11		0.09	
URATE4	= 1 if local unemployment rate is between 9.0 and 11.9%, 0 otherwise;	0.06		0.04	
Occupational Characteristics of the Current or Previous Job					
OCCUP1	= referenced if the occupation is professional, managerial, or technical;	0.25		0.17	
OCCUP2	= 1 if the occupation is sales or clerical and kindred, 0 otherwise;	0.29		0.25	
OCCUP3	= 1 if the occupation is laborers, craftmen, or operatives, 0 otherwise;	0.09		0.10	
OCCUP4	= 1 if the occupation is service or private household workers, 0 otherwise	0.37		0.48	
PUBLIC	= 1 if the job is in public sector (i.e., government employee), 0 otherwise.	0.29		0.23	
UNION	= 1 if wages and salaries are set by a collective bargaining, 0 otherwise.	0.09		0.17	
Number of Cases		2477		1472	

Note: * for continuous variables only.
** For categorical variables the figures refer to the % of the sample in that category.

Table 4. Weibull Hazard Model Estimates of the Rate of Transition from Employment to Nonemployment

WHITES

	Model 1		Model 2		Model 3		Model 4	
VARIABLES	B	(S.E.)	B	(S.E.)	B	(S.E.)	B	(S.E.)
CONSTANT	-0.367	(0.020)	-0.328	(0.031)	-0.043	(0.042)	-0.175	(0.050)
DURATION	-0.264	(0.008)	-0.261	(0.008)	-0.253	(0.008)	-0.226	(0.009)
AGE16-19	0.260	(0.032)	0.238	(0.031)	0.190	(0.032)	0.166	(0.034)
AGE25-29	-0.319	(0.026)	-0.303	(0.026)	-0.279	(0.027)	-0.182	(0.030)
AGE30-34	-0.515	(0.048)	-0.500	(0.049)	-0.453	(0.050)	-0.271	(0.058)
FAMST2	0.276	(0.027)	0.272	(0.027)	0.276	(0.028)	0.291	(0.028)
FAMST3	0.366	(0.059)	0.301	(0.060)	0.237	(0.060)	0.241	(0.064)
FAMST4	0.507	(0.024)	0.469	(0.024)	0.432	(0.025)	0.391	(0.028)
FAED12			-0.077	(0.020)	-0.035	(0.021)	-0.038	(0.025)
FAEDMIS			0.036	(0.037)	-0.030	(0.040)	-0.034	(0.046)
MOED12			-0.079	(0.020)	-0.014	(0.022)	-0.009	(0.026)
BRKFAM			0.146	(0.022)	0.113	(0.022)	0.096	(0.026)
RSOUTH			-0.059	(0.021)	-0.083	(0.021)	-0.081	(0.024)
NUMSIB			0.023	(0.005)	0.017	(0.005)	0.014	(0.005)
FAMATT					0.009	(0.010)	0.007	(0.011)
WORK35					-0.048	(0.020)	-0.017	(0.023)
IQ SCORE					-0.139	(0.016)	-0.121	(0.018)
HGC=12					-0.268	(0.031)	-0.187	(0.038)
HGC13-15					-0.303	(0.038)	-0.234	(0.045)
HGC>=16					-0.307	(0.046)	-0.277	(0.053)
NSPELLM							0.101	(0.007)
TPDURM1							-0.308	(0.034)
TPDURM2							0.018	(0.008)
- LL	6197.650		6170.988		6099.824		5954.197	
Number of Spells	8596		8596		8596		8596	

Table 4. (Continued) Weibull Model Estimates of the Rate of Transition from Employment to Nonemployment

WHITES

	Model 5		Model 6		Model 7		Moel 8	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
CONSTANT	0.996	0.073	0.893	0.075	0.595	0.086	1.931	0.121
DURATION	-0.191	0.009	-0.189	0.009	-0.170	0.009	-0.016	0.012
AGE16-19	0.156	0.034	0.158	0.035	0.150	0.035	0.232	0.044
AGE25-29	-0.177	0.030	-0.161	0.030	-0.177	0.030	-0.242	0.036
AGE30-34	-0.283	0.056	-0.254	0.056	-0.275	0.058	-0.418	0.070
FAMST2	0.254	0.028	0.252	0.028	0.280	0.028	0.314	0.036
FAMST3	0.179	0.066	0.170	0.066	0.137	0.065	0.218	0.078
FAMST4	0.331	0.028	0.323	0.028	0.314	0.028	0.489	0.039
TEST SCORE	-0.074	0.018	-0.073	0.018	-0.043	0.018	-0.092	0.028
HGC=12	-0.200	0.037	-0.201	0.037	-0.195	0.038	-0.264	0.060
HGC13-15	-0.177	0.044	-0.174	0.045	-0.154	0.045	-0.177	0.070
HGC>=16	-0.102	0.053	-0.097	0.053	0.009	0.054	0.028	0.082
NSPELLM	0.070	0.006	0.072	0.006	0.067	0.006	-0.059	0.009
TPDURM1	-0.224	0.033	-0.239	0.034	-0.228	0.034	0.030	0.040
TPDURM2	0.013	0.008	0.017	0.008	0.019	0.008	0.005	0.009
LWAGE	-0.567	0.010	-0.564	0.010	-0.528	0.012	-0.619	0.014
LSPINC	-0.026	0.006	-0.026	0.006	-0.020	0.005	-0.033	0.007
SMSNC			0.069	0.023	0.064	0.024	0.064	0.031
SMSCT			0.075	0.043	0.102	0.044	0.034	0.056
URATE2			0.032	0.026	0.030	0.026	0.067	0.032
URATE3			0.109	0.031	0.102	0.031	0.175	0.038
URATE4			0.169	0.034	0.177	0.034	0.230	0.044
OCCUP2					0.253	0.036	0.381	0.045
OCCUP3					0.486	0.043	0.633	0.055
OCCUP4					0.590	0.037	0.654	0.045
PUBLIC					-0.267	0.026	-0.378	0.032
UNION					-0.068	0.037	-0.053	0.047
HETEROGENEITY							-1.159	0.039
- LL		5580.393		5567.016		5314.738		5087.712
Number of Spells		8596		8596		8596		8596

Note: Models 5-8 also control for the family background, work attitude, and early work plan.

Table 5. Weibull Hazard Model Estimates of the Rate of Exit from Employment to Nonemployment

BLACKS

	Model 1		Model 2		Model 3		Model 4	
VARIABLES	B	(S.E.)	B	(S.E.)	B	(S.E.)	B	(S.E.)
CONSTANT	-0.239	(0.026)	-0.230	(0.043)	0.140	(0.061)	0.025	(0.070)
DURATION	-0.289	(0.011)	-0.280	(0.011)	-0.260	(0.011)	-0.239	(0.012)
AGE16-19	0.430	(0.054)	0.445	(0.056)	0.343	(0.056)	0.328	(0.055)
AGE25-29	-0.192	(0.033)	-0.188	(0.033)	-0.164	(0.033)	-0.031	(0.039)
AGE30-34	-0.283	(0.059)	-0.310	(0.058)	-0.302	(0.056)	-0.110	(0.062)
FAMST2	0.081	(0.054)	0.097	(0.055)	0.063	(0.055)	0.128	(0.057)
FAMST3	0.290	(0.031)	0.250	(0.032)	0.135	(0.033)	0.153	(0.036)
FAMST4	0.199	(0.034)	0.197	(0.034)	0.108	(0.036)	0.118	(0.039)
FAED12			-0.101	(0.031)	-0.015	(0.032)	-0.016	(0.036)
FAEDMIS			0.018	(0.032)	-0.003	(0.033)	-0.003	(0.037)
MOED12			-0.036	(0.027)	0.027	(0.028)	0.016	(0.032)
BRKFAM			0.182	(0.025)	0.153	(0.025)	0.135	(0.029)
RSOUTH			-0.174	(0.025)	-0.190	(0.025)	-0.175	(0.028)
NUMSIB			0.015	(0.004)	0.007	(0.004)	0.006	(0.005)
FAMATT					0.018	(0.012)	0.011	(0.014)
WORK35					-0.043	(0.030)	-0.023	(0.034)
TEST SCORE					-0.154	(0.022)	-0.130	(0.024)
HGC=12					-0.334	(0.035)	-0.243	(0.041)
HGC13-15					-0.514	(0.043)	-0.443	(0.049)
HGC>=16					-0.735	(0.062)	-0.698	(0.068)
NSPELLM							0.104	(0.011)
TPDURM1							-0.437	(0.049)
TPDURM2							0.034	(0.012)
- LL	3107.050		3062.640		2946.730		2880.366	
Number of Spells	5092		5092		5092		5092	

Table 5. (Continued) Weibull Model Estimates of the Rate of Transition from Employment to Nonemployment

BLACKS

	Model 5		Model 6		Model 7		Moel 8	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
CONSTANT	1.012	0.088	0.874	0.092	0.374	0.103	0.463	0.145
DURATION	-0.212	0.012	-0.210	0.012	-0.195	0.012	-0.030	0.017
AGE16-19	0.320	0.056	0.336	0.057	0.298	0.056	0.194	0.064
AGE25-29	-0.068	0.039	-0.055	0.039	-0.050	0.039	-0.073	0.047
AGE30-34	-0.146	0.062	-0.122	0.063	-0.161	0.064	-0.155	0.081
FAMST2	0.162	0.059	0.172	0.059	0.185	0.061	0.225	0.076
FAMST3	0.182	0.036	0.189	0.036	0.156	0.036	0.183	0.048
FAMST4	0.159	0.039	0.164	0.040	0.132	0.040	0.177	0.053
TEST SCORE	-0.077	0.025	-0.072	0.025	-0.037	0.026	-0.075	0.041
HGC=12	-0.189	0.042	-0.197	0.042	-0.150	0.042	-0.209	0.064
HGC13-15	-0.275	0.051	-0.293	0.050	-0.203	0.050	-0.368	0.076
HGC>=16	-0.404	0.072	-0.407	0.073	-0.186	0.075	-0.406	0.106
NSPELLM	0.097	0.011	0.099	0.011	0.105	0.010	-0.036	0.013
TPDURM1	-0.391	0.050	-0.392	0.051	-0.422	0.051	-0.183	0.058
TPDURM2	0.035	0.012	0.035	0.013	0.044	0.013	0.036	0.013
LWAGE	-0.533	0.011	-0.543	0.012	-0.550	0.015	-0.594	0.020
LSPINC	-0.029	0.007	-0.030	0.007	-0.026	0.007	-0.032	0.009
SMSNC			0.070	0.035	0.111	0.034	0.090	0.045
SMSCT			0.163	0.042	0.207	0.042	0.181	0.055
URATE2			0.067	0.033	0.068	0.032	0.150	0.039
URATE3			0.170	0.043	0.198	0.043	0.286	0.054
URATE4			0.158	0.052	0.159	0.052	0.228	0.067
OCCUP2					0.493	0.058	0.598	0.066
OCCUP3					0.735	0.063	0.853	0.075
OCCUP4					0.682	0.055	0.755	0.064
PUBLIC					-0.147	0.032	-0.245	0.039
UNION					-0.298	0.042	-0.341	0.051
HETEROGENEITY							1.193	0.054
- LL	2671.283		2658.192		2546.481		2417.474	
N	5092		5092		5092		5092	

Note: Models 5-8 also control for the family background variables, work attitude, and work plan at 35.

Table 6. Model Fit Statistics for Employment Spell Models by Race

BLACKS (N=5092)	- LL	D.F.	Chi-square	Change in D.F.	BIC	Model Specification
Base Line	3176.884	5090			-40268.434	Constant + Duration
Model 1	3107.050	5084	139.668	6	-40287.056	Model 0 + Age + Family Status
Model 2	3062.640	5078	88.820	6	-40280.253	Model 1 + Family Background
Model 3	2946.730	5072	231.820	6	-40344.950	Model 2 + Att., Abil, Education
Model 4	2880.365	5069	132.730	3	-40385.709	Model 3 + Past Work History
Model 5	2671.283	5067	418.164	2	-40577.720	Model 4 + Wage + Husband's Inc.
Model 6	2658.192	5062	26.182	5	-40548.134	Model 5 + SMSA + Unemp. Rate
Model 7	2546.481	5057	223.422	5	-40617.168	Model 6 + Occupation Var.
Model 8	2417.474	5056	258.014	1	-40737.640	Model 7 + Heterogeneity

WHITES (N = 8596)	- LL	D.F.	Chi-square	Change in D.F.	BIC	Model Specification
Base Line	6394.884	8594			-71458.611	Constant + Duration
Model 1	6197.650	8588	394.468	6	-71601.491	Model 0 + Age + Family Status
Model 2	6170.988	8582	53.324	6	-71573.798	Model 1 + Family Background
Model 3	6099.824	8576	142.328	6	-71590.608	Model 2 + Att., Abil, Education
Model 4	5954.197	8573	291.254	3	-71709.058	Model 3 + Past Work History
Model 5	5580.393	8571	747.608	2	-72064.744	Model 4 + Wage + Husband's Inc.
Model 6	5567.016	8566	26.754	5	-72032.826	Model 5 + SMSA + Unemp. Rate
Model 7	5314.738	8561	504.556	5	-72239.808	Model 6 + Occupation Var.
Model 8	5087.712	8560	454.052	1	-67975.534	Model 7 + Heterogeneity

Note: N = total number of spells
Chi-square statistic = - 2*[LL1 - LL2]
BIC statistics = (- LL) - D.F.*ln(N)

Table 7. Predicted Hazard Rates of Transition from Employment to Nonemployment* For Whites and Blacks by Family Status and by Education

WHITES	HGC<12	HGC=12	HGC13-15	HGC>=16
Family Status				
FAMST=1	0.0883	0.0726	0.0757	0.0890
FAMST=2	0.1167	0.0960	0.1001	0.1177
FAMST=3	0.1013	0.0833	0.0868	0.1022
FAMST=4	0.1210	0.0995	0.1037	0.1220

BLACKS	HGC<12	HGC=12	HGC13-15	HGC>=16
Family Status				
FAMST=1	0.1251	0.0832	0.0788	0.0802
FAMST=2	0.1506	0.1001	0.0948	0.0965
FAMST=3	0.1463	0.0972	0.0921	0.0937
FAMST=4	0.1427	0.0949	0.0899	0.0915

WHITE-BLACK	HGC<12	HGC=12	HGC13-15	HGC>=16
Family Status				
FAMST=1	-0.0369	-0.0106	-0.0032	0.0088
FAMST=2	-0.0339	-0.0041	0.0052	0.0212
FAMST=3	-0.0449	-0.0139	-0.0053	0.0085
FAMST=4	-0.0218	0.0046	0.0138	0.0305

Note: * Time unit is 10 weeks.

Note: The predicted rates are based on Model 7 and standardized on blacks and whites 25-29 years old with : DURATION = 26 WEEKS, FAED>=12, MOED>=12, FAEDMIS=0, BRKFAM=0, RSOUTH=0, WORK35=1, AGE3=1, SMSNC=1, URATE2=1, OCCUP2=1, PUBLIC=0, UNION=0, with race-specific mean values for covariates (Table 7.3)

Table 8. Weibull Model Estimates of the Rate of Transition from Nonemployment to Employment

WHITES

	Model 1		Model 2		Model 3		Model 4	
VARIABLES	B	S.E.	B	S.E.	B	S.E.	B	S.E.
CONSTANT	-0.625	(0.018)	-0.699	(0.028)	-0.880	(0.041)	-0.927	(0.048)
DURATION	-0.315	(0.007)	-0.311	(0.007)	-0.304	(0.007)	-0.294	(0.008)
AGE16-19	-0.338	(0.033)	-0.299	(0.034)	-0.227	(0.035)	-0.232	(0.036)
AGE25-29	0.101	(0.024)	0.075	(0.024)	0.033	(0.024)	0.017	(0.026)
AGE30-34	0.288	(0.037)	0.257	(0.037)	0.177	(0.037)	0.124	(0.043)
FAMST2	-0.379	(0.029)	-0.357	(0.029)	-0.351	(0.030)	-0.383	(0.031)
FAMST3	-0.793	(0.048)	-0.740	(0.049)	-0.662	(0.050)	-0.642	(0.053)
FAMST4	-0.872	(0.022)	-0.837	(0.023)	-0.799	(0.024)	-0.791	(0.027)
FAED12			0.090	(0.020)	0.043	(0.021)	0.032	(0.023)
FAEDMIS			-0.192	(0.037)	-0.096	(0.038)	-0.070	(0.042)
MOED12			0.100	(0.020)	0.022	(0.021)	0.019	(0.023)
BRKFAM			-0.063	(0.022)	-0.029	(0.023)	-0.024	(0.025)
RSOUTH			-0.038	(0.019)	-0.007	(0.020)	0.013	(0.022)
NUMSIB			-0.010	(0.005)	-0.006	(0.005)	-0.007	(0.005)
FAMATT					-0.021	(0.010)	-0.023	(0.011)
WORK35					-0.043	(0.018)	-0.037	(0.020)
TEST SCORE					0.082	(0.014)	0.082	(0.015)
HGC = 12					0.214	(0.029)	0.191	(0.032)
HGC 13-15					0.323	(0.037)	0.285	(0.041)
HGC >= 16					0.349	(0.043)	0.320	(0.048)
NSPELLN							0.067	(0.005)
TPDURN1							-0.389	(0.036)
TPDURN2							0.069	(0.009)
- LL	15570.17		15533.59		15467.12		15406.25	
Number of Spells	7955		7955		7955		7955	

Table 8. (Continued) Weibull Hazard Model Estimates of the Rate of Exit from Nonemployment to Employment

	WHITES							
	Model 5		Model 6		Model 7		Moel 8	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
CONSTANT	-1.071	0.072	-1.207	0.074	-1.075	0.089	-0.794	0.113
DURATION	-0.293	0.008	-0.288	0.008	-0.277	0.008	-0.130	0.010
AGE16-19	-0.228	0.036	-0.211	0.037	-0.149	0.038	-0.166	0.043
AGE25-29	0.003	0.027	-0.004	0.027	-0.034	0.028	0.060	0.034
AGE30-34	0.107	0.043	0.101	0.044	0.075	0.044	0.189	0.057
FAMST2	-0.384	0.032	-0.383	0.032	-0.378	0.031	-0.357	0.037
FAMST3	-0.644	0.053	-0.634	0.052	-0.596	0.053	-0.609	0.072
FAMST4	-0.795	0.027	-0.792	0.027	-0.768	0.027	-0.863	0.037
TEST SCORE	0.079	0.016	0.076	0.016	0.068	0.016	0.113	0.023
HGC=12	0.189	0.032	0.197	0.033	0.199	0.033	0.309	0.046
HGC13-15	0.273	0.042	0.277	0.042	0.305	0.043	0.467	0.061
HGC>=16	0.297	0.048	0.316	0.049	0.321	0.050	0.466	0.075
NSPELLN	0.067	0.005	0.065	0.005	0.062	0.006	-0.011	0.007
TPDURN1	-0.370	0.037	-0.363	0.037	-0.382	0.037	-0.037	0.048
TPDURN2	0.067	0.009	0.066	0.009	0.071	0.009	0.032	0.011
LWAGE	0.083	0.024	0.082	0.024	0.068	0.024	0.092	0.029
LSPINC	0.003	0.005	0.001	0.005	-0.001	0.005	0.008	0.006
SMSNC			0.149	0.022	0.143	0.023	0.188	0.029
SMSCT			0.147	0.043	0.150	0.044	0.211	0.055
URATE2			0.156	0.024	0.146	0.025	0.136	0.029
URATE3			0.086	0.031	0.064	0.031	0.029	0.036
URATE4			-0.033	0.031	-0.057	0.032	-0.089	0.039
OCCUP2					-0.233	0.040	-0.173	0.049
OCCUP3					-0.081	0.044	-0.047	0.054
OCCUP4					-0.212	0.041	-0.172	0.048
PUBLIC					0.172	0.029	0.155	0.031
UNION					0.154	0.040	0.134	0.046
HETEROGENEITY							-1.070	0.042
- LL	15401.490		15357.970		15293.700		15041.580	
N	7955		7955		7955		7955	

Note: Model 5-8 also control for family background variables, work attitudes, and work plan at 35.

Table 9. Weibull Model Estimates of the Rate of Exit from Nonemployment to Employment

BLACKS

	Model 1		Model 2		Model 3		Model 4	
VARIABLES	B	S.E.	B	S.E.	B	S.E.	B	S.E.
CONSTANT	-1.233	(0.026)	-1.198	(0.043)	-1.355	(0.061)	-1.472	(0.068)
DURATION	-0.317	(0.009)	-0.300	(0.009)	-0.273	(0.009)	-0.260	(0.010)
AGE16-19	-0.523	(0.045)	-0.505	(0.045)	-0.403	(0.047)	-0.404	(0.048)
AGE25-29	0.268	(0.031)	0.273	(0.031)	0.235	(0.031)	0.230	(0.036)
AGE30-34	0.205	(0.057)	0.215	(0.056)	0.172	(0.055)	0.178	(0.062)
FAMST2	-0.172	(0.055)	-0.199	(0.055)	-0.194	(0.057)	-0.235	(0.060)
FAMST3	-0.518	(0.030)	-0.479	(0.031)	-0.409	(0.031)	-0.419	(0.034)
FAMST4	-0.283	(0.032)	-0.300	(0.033)	-0.282	(0.033)	-0.340	(0.036)
FAED12			0.067	(0.029)	-0.039	(0.030)	-0.029	(0.032)
FAEDMIS			-0.072	(0.029)	-0.066	(0.030)	-0.062	(0.032)
MOED12			0.199	(0.025)	0.116	(0.026)	0.094	(0.029)
BRKFAM			-0.019	(0.024)	-0.007	(0.024)	-0.003	(0.027)
RSOUTH			0.132	(0.023)	0.165	(0.024)	0.180	(0.027)
NUMSIB			-0.040	(0.004)	-0.032	(0.004)	-0.027	(0.004)
FAMATT					-0.030	(0.012)	-0.030	(0.013)
WORK35					-0.048	(0.028)	-0.042	(0.031)
TEST SCORE					0.229	(0.020)	0.210	(0.022)
HGC = 12					0.381	(0.034)	0.321	(0.038)
HGC 13-15					0.420	(0.042)	0.359	(0.047)
HGC >= 16					0.567	(0.065)	0.512	(0.071)
NSPELLN							0.083	(0.008)
TPDURN1							-0.188	(0.043)
TPDURN2							0.010	(0.010)
- LL	12323.98		12176.738		12104.85		12026.93	
Number of Spells	5135		5135		5135		5135	

Table 9. (Continued) Weibull Hazard Model Estimates of the Rate of Exit from Nonemployment to Employment

	BLACKS							
	Model 5		Model 6		Model 7		Moel 8	
	B	S.E.	B	S.E.	B	S.E.	B	S.E.
CONSTANT	-1.847	0.096	-1.849	0.099	-1.680	0.118	-1.256	0.154
DURATION	-0.258	0.010	-0.251	0.010	-0.238	0.010	-0.106	0.014
AGE16-19	-0.406	0.048	-0.401	0.048	-0.338	0.049	-0.345	0.058
AGE25-29	0.213	0.037	0.183	0.037	0.141	0.037	0.194	0.046
AGE30-34	0.142	0.061	0.094	0.063	0.106	0.064	0.290	0.083
FAMST2	-0.223	0.061	-0.209	0.062	-0.195	0.063	-0.228	0.074
FAMST3	-0.422	0.034	-0.423	0.034	-0.417	0.035	-0.452	0.046
FAMST4	-0.343	0.036	-0.338	0.036	-0.329	0.037	-0.293	0.050
TEST SCORE	0.209	0.022	0.205	0.022	0.199	0.023	0.257	0.037
HGC=12	0.294	0.038	0.310	0.039	0.305	0.039	0.526	0.062
HGC13-15	0.302	0.048	0.320	0.048	0.326	0.050	0.629	0.076
HGC>=16	0.449	0.072	0.481	0.074	0.476	0.077	0.827	0.142
NSPELLN	0.081	0.008	0.076	0.008	0.071	0.008	-0.018	0.013
TPDURN1	-0.167	0.043	-0.167	0.043	-0.198	0.044	0.121	0.057
TPDURN2	0.007	0.010	0.006	0.010	0.015	0.010	-0.025	0.012
LWAGE	0.168	0.038	0.159	0.037	0.154	0.037	0.192	0.043
LSPINC	0.023	0.007	0.022	0.007	0.019	0.007	0.031	0.008
SMSNC			0.156	0.032	0.143	0.032	0.112	0.042
SMSCT			0.085	0.039	0.087	0.040	0.044	0.052
URATE2			-0.030	0.031	-0.052	0.032	-0.125	0.039
URATE3			-0.218	0.041	-0.245	0.041	-0.272	0.050
URATE4			-0.301	0.049	-0.331	0.050	-0.343	0.064
OCCUP2					-0.188	0.062	-0.188	0.078
OCCUP3					-0.106	0.066	-0.134	0.083
OCCUP4					-0.239	0.060	-0.225	0.076
PUBLIC					0.183	0.035	0.175	0.040
UNION					0.115	0.045	0.178	0.053
HETEROGENEITY							-1.080	0.053
- LL	12012.640		11983.390		11942.530		11822.290	
N	5135		5135		5135		5135	

Note: Models 5-8 also control for family background variables, work attitudes, and work plan at 35.

Table 10. Model Fit Statistics for Nonemployment Spell Models by Race

BLACKS (N=5135)	- LL	D.F.	Chi-square	Change in D.F.	BIC	Model Specification
Base Line	12525.569	5133			-31286.772	Constant + Duration
Model 1	12323.980	5127	403.178	6	-31437.149	Model 0 + Age + Family Status
Model 2	12176.738	5121	294.484	6	-31533.178	Model 1 + Family Background
Model 3	12104.850	5115	143.776	6	-31553.854	Model 2 + Att., Abil, Education
Model 4	12026.930	5112	155.840	3	-31606.168	Model 3 + Past Work History
Model 5	12012.640	5110	28.580	2	-31603.387	Model 4 + Wage + Husband's Inc.
Model 6	11983.390	5105	58.500	5	-31589.960	Model 5 + SMSA + Unemp. Rate
Model 7	11942.530	5100	81.720	5	-31588.142	Model 6 + Occupation Var.
Model 8	11822.290	5099	240.480	1	-31699.847	Model 7 + Heterogeneity

WHITES (N = 7955)	- LL	D.F.	Chi-square	Change in D.F.	BIC	Model Specification
Base Line	16005.266	7953			-56041.377	Constant + Duration
Model 1	15570.170	7947	870.192	6	-56422.118	Model 0 + Age + Family Status
Model 2	15533.590	7941	73.160	6	-56404.344	Model 1 + Family Background
Model 3	15467.120	7935	132.940	6	-56416.460	Model 2 + Att., Abil, Education
Model 4	15406.250	7932	121.740	3	-56450.153	Model 3 + Past Work History
Model 5	15401.490	7930	9.520	2	-56436.794	Model 4 + Wage + Husband's Inc.
Model 6	15359.970	7925	83.040	5	-56433.019	Model 5 + SMSA + Unemp. Rate
Model 7	15293.700	7920	132.540	5	-56453.994	Model 6 + Occupation Var.
Model 8	15041.580	7918	504.240	2	-52541.923	Model 7 + Heterogeneity

Note: N = total number of spells
Chi-square statistic = - 2*[LL1 - LL2]
BIC statistics = (- LL) - D.F.*ln(N)

Table 11. Predicted Hazard Rates of Transition from Non-Employment to Employment* by Family Status and by Education: White and Black Women, 1979-1991

WHITES	HGC<12	HGC=12	HGC13-15	HGC>=16
Family Status				
FAMST=1	0.3224	0.3546	0.3940	0.4005
FAMST=2	0.2209	0.2429	0.2699	0.2744
FAMST=3	0.1776	0.1953	0.2170	0.2206
FAMST=4	0.1495	0.1644	0.1827	0.1858

BLACKS	HGC<12	HGC=12	HGC13-15	HGC>=16
Family Status				
FAMST=1	0.1622	0.2731	0.2789	0.3240
FAMST=2	0.1622	0.2731	0.2789	0.3240
FAMST=3	0.1299	0.2187	0.2234	0.2595
FAMST=4	0.1418	0.2388	0.2439	0.2833

WHITE-BLACK	HGC<12	HGC=12	HGC13-15	HGC>=16
Family Status				
FAMST=1	0.1603	0.0815	0.1150	0.0766
FAMST=2	0.0587	-0.0302	-0.0091	-0.0496
FAMST=3	0.0477	-0.0234	-0.0064	-0.0389
FAMST=4	0.0077	-0.0744	-0.0612	-0.0976

Note: * Time Unit is 10 Weeks

Note: The predicted rates are based on Model 8 and standardized on blacks and whites 25-29 years old with : DURATION = 26 WEEKS, FAED>=12, MOED>=12, FAEDMIS=0, BRKFAM=0, RSOUTH=0, WORK35=1, AGE3=1, SMSNC=1, URATE2=1, OCCUP2=1, PUBLIC=0, UNION=0, with race-specific mean values for covariates (Table 7.3)

Figure 1 Kaplan-Meier Estimates of Survivorship in Employment by Race
Among White and Black Women at Ages 16-34

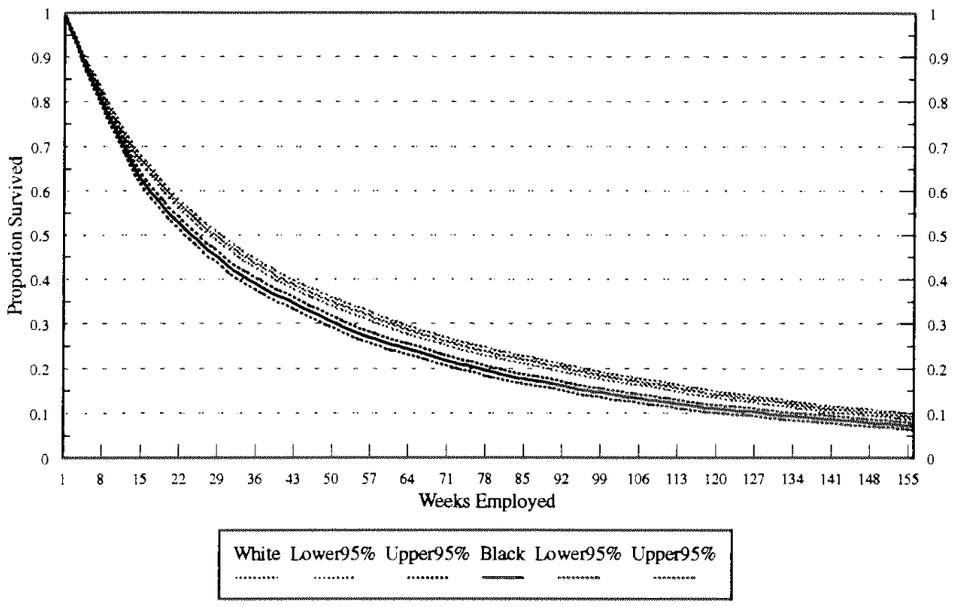
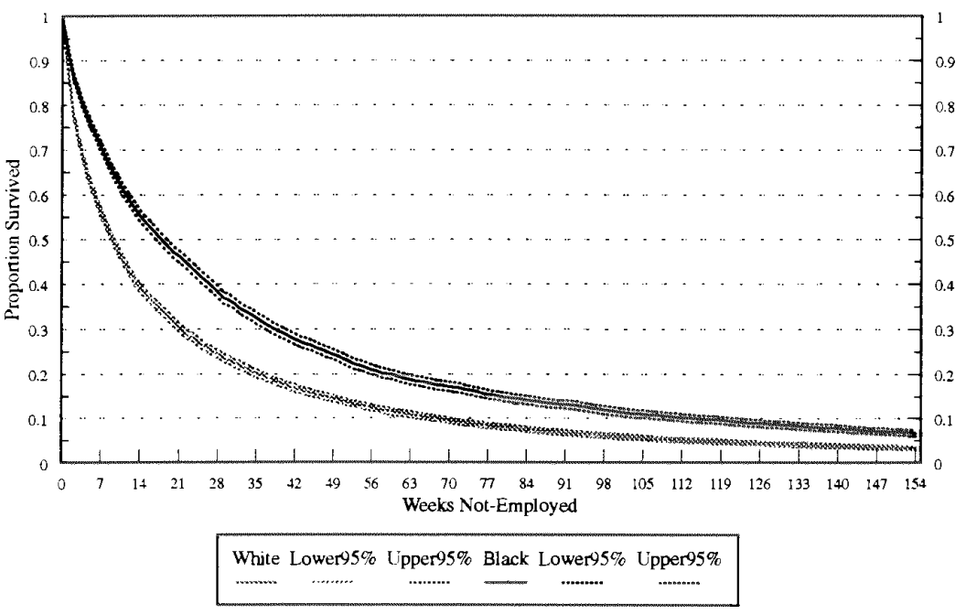


Figure 2 Kaplan-Meier Estimates of Survivorship in Non-Employment by Race
Among White and Black Women at Ages 16-34



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