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Child care and employment turnover

SANDRA HOFFERTH & NANCY COLLINS
University of Michigan, USA

Abstract. This paper explores how the responsibility of caring for children affects employment stability by studying the relationship between the characteristics and stability of substitute caregivers and the risk of leaving of job. The data come from the 1990 National Child Care Survey (NCCS), a nationally representative survey of households with children under age 13 conducted in late 1989 and early 1990, and A Profile of Child Care Settings (PCS), a nationally representative survey of center-based programs and licensed family day care homes in the U.S., conducted at the same time and in the same 144 counties. The results show that the availability of care affects the job stability of all employed mothers. Other effects differ by maternal wage. The cost of care affects the employment exits of moderate-wage mothers (who earn $6 to $8 per hour), the stability of care affects the employment exits of moderate- and high-wage mothers, and the flexibility of care affects the employment exits of low-wage mothers. These results are discussed in the context of current public policies.

Keywords: Child care, Female labor force participation, Public policy

Introduction

The gender gap in earnings has narrowed in recent years – recent statistics show women's earnings at 74 percent of men's (U.S. Bureau of the Census 1997) – but it has not disappeared. One possible reason the gap has not closed is that women's responsibility to care for children continues to hinder their employment. In examining gender differences in earnings, research has singled out differences in labor force participation that result from women's family obligations (Korenman & Neumark 1992). Research finds that women with children spend less time in full-time, full-year work than women without children and that this difference in work experience explains at least part of the earnings gap (Hill 1979; Waldfogel 1997). In addition to cumulative work experience, continuous employment is important to subsequent labor market success. Disruptions in an individual's work history result in lower wages not only through reduced accumulation of work experience but also through the deterioration of skills while out of the labor force (Mincer & Ofek 1982). While their labor force attachment has increased dramatically, women's employment is still characterized by more turnover than men's (Blau et al. 1998; Blau & Kahn 1981; Viscusi 1980). As combining employment and moth-

erhood becomes increasingly common among women, and as women's role either as sole provider or major partner in the economic support of families becomes more important (Dechter & Smock 1994), work histories become critical to the economic well-being of women and their families. In addition, to the extent that employers perceive young women's employment stability as low, they may be less willing to hire and train young women for career positions (Donohue 1988; Jacobsen & Levin 1995).

Today it is more important than ever to examine the work patterns of low-income mothers. Such women work, but because the work is intermittent, informal, or underground (Harris 1993, 1996; Edin & Lein 1997), they fail to accumulate the labor market experience and human capital necessary for wage growth. Due to the passage of federal welfare reform legislation in August 1996, which increased work requirements and placed time limits on receipt of public assistance, it is precisely this group that will be entering the regular labor force in large numbers over the next few years. While efforts to move women into the work force have been successful, efforts to help them maintain employment have shown less success (Berg et al. 1992). Of recipients who leave welfare for work, between 25 and 40 percent return to AFDC within a year (Hershey & Pavetti 1997; Harris 1996). As many as 60 percent who leave welfare for work are no longer employed within 6 to 12 months (Hershey & Pavetti 1997).

A number of factors, such as poor performance, poor social skills, and failure to meet workplace expectations, are at least partially to blame for intermittent employment among low-income women. Still, having young children contributes directly and indirectly to job leaving among women of all income levels by reducing the rewards and raising the costs of employment, and by raising the risk of firing or dismissal due to failure to meet attendance requirements (Felmlee 1984; Pavetti 1993). Previous research has highlighted the need for substitute care for children as one critical factor. Higher wages make the purchase of substitutes for the mother's time affordable (Hersch 1991), but child care arrangements can be hard to find, unstable, and costly, substantially reducing the benefits and, therefore, the probability of working (Hayes et al. 1990). Even the wealthiest mother has little control over illness and other changes in provider circumstances. Understanding how variations in the characteristics of substitute care arrangements influence employment exits among mothers can contribute to understanding the origin of differences in wages and earnings among women at all earnings levels.

Of course, this discussion assumes that mothers have an alternative source of income that would enable them to exit and remain out of the work force. Some mothers, whether because of the low income of their household or their role as sole provider, may be less responsive to the constraints of children

because their alternatives are limited. Rather than leaving the work force, they may, instead, reduce their expenditures on child care by using informal sources or by working at home (Connelly 1992b). Other mothers who are eligible for public assistance may be more likely to leave the paid work force if they have child care problems than those without that source of support to fall back on. Thus we expect maternal-wage-based variation in the influence of substitute care on exit decisions.

This paper explores how the cost, quality, and availability of nonmaternal child care influence the probability of a maternal work exit and explain the effects on employment of having and rearing children. In particular, we examine the influence of children and child care on the probability that a mother of a young child will leave her current job.[1] Since job changes may be beneficial if they provide a means to obtaining better pay and working conditions, we focus primarily on job exits that do not immediately result in another job. Finally, we examine how the influences of children and child care on job exits differ according to the wage level of the mother.

Some previous research has looked at the effect of children on employment exits in a dynamic framework (Felmlee 1984) and other research has examined the influence of child care on labor force participation in the cross-section (Brayfield 1995; Connelly 1992a; Fronstin & Wissoker 1994; Kimmel 1992; Stolzenberg & Waite 1984). Yet few studies have looked at the joint effects of both children and child care in a dynamic context. Of those that do, point-in-time data spaced one year apart, which underestimate the amount of work force and child care turnover over the course of a year, have heretofore been the only data available to model the hazard of exiting the labor force (Blau & Robins 1991; Maume 1991). With such data we have been unable to link the timing of monthly spells of child care with spells of employment. The present analysis takes advantage of a unique national data set that provides a monthly history of employment, fertility, and the care of the youngest preschool child, as well as information on alternative child care arrangements and characteristics of the local community. It fills an important gap by systematically examining how the responsibility of caring for children weakens mothers' employment tenure.

Theoretical framework

This paper draws on economic and sociological theories of women's employment. From economic theory we derive expectations about how individual and family characteristics influence individual decisions regarding paid employment. From sociological theory we derive expectations about how factors such as access, alternatives, and preferences constrain these decisions.

In an economic framework, the decision to pursue paid employment over unpaid domestic activity depends upon the relative value of a mother's time in the market compared to the value of her time at home (Blau et al. 1998; Becker 1991). For a woman who is currently employed, the decision to continue working occurs if the total expected value of participating in the formal labor market is greater than the total expected value of not participating. The value of market time depends upon the potential wage of the mother (a function of education and work experience) and the cost of substitutes for her time. The value of home time depends on productivity in the home. Productivity is linked to maternal education; the time better-educated mothers spend in childrearing has been shown to predict child cognitive development more strongly than that of less-educated mothers (Leibowitz 1974b). Income from other family members reduces the opportunity cost of staying home, leading to lower labor force participation.

There is substantial empirical evidence for an economic framework for maternal employment decisions. The cost of employment is high and the value of home time high immediately following birth; as a result, most mothers are out for several months. Factors influencing how soon mothers return include family income and maternal wage, indicators of the value of home and market time, respectively (Hofferth 1996; Leibowitz et al. 1992). Consistent with the economic framework, the cost of child care has also been linked to maternal employment. Numerous researchers have documented an association between the cost of child care and maternal employment at one point in time (Blau & Robins 1988; Connelly 1992a; Kimmel 1992; Stolzenberg & Waite 1984). One difficulty with measuring the influence of cost on employment in cross-sectional data is that usually all we see is the result of the decision-making process, without knowing what child care alternatives were considered and rejected and what tradeoffs were made between price and other characteristics of care.

In one of two longitudinal studies, Blau & Robins (1989) found that higher-cost child care was associated with a lower probability of starting and a higher probability of exiting employment, among a primarily low-income sample. The effects are not large. Maume (1991) found a $10 difference in weekly child care expenditures to be associated with a 1.6 percent increase in the probability of leaving employment a year later. Factors other than the financial cost of care may be taken into account in evaluating the value of market versus home time. These include the time cost – convenience, availability – and the psychic cost – the cost to the mother of worrying about whether the care is adequate.

The decision to continue working at the current job is contingent on the total expected value of the current job being greater than the total expected

value of the best alternative job. If the current job becomes more attractive, the probability of leaving decreases, while if the current job becomes less attractive or other alternative jobs become more attractive, the probability of leaving increases. Most importantly, opportunities and responsibilities outside the labor market might increase, causing an individual to leave. The theory, however, says nothing about how children fit into this decision to leave a job except insofar as having another child reduces the benefits of work and increases the benefits of home time. The theory describes how the relative value of market compared to nonmarket time rises with the age of the child, thus leading women to return to the labor force. Employed mothers' ability to secure adequate alternative care for her child/children is rarely considered in theory except during the post-childbirth period.

Sociological theory, in contrast to economic theory, focuses on the social and cultural environments in which parents make their decisions (Marini 1992). First, some parents may have no access at all to certain types of care. Single mother families are less likely to have access to father care, for example. The absence of a spouse or other adult in the household who could provide assistance in caring for children increases the cost of employment and reduces maternal work effort. Child care that conforms to the parent's work schedule may not be available. For example, while care for older preschoolers ages 3 to 4 is abundant, care for children under age 3, especially infant care, is in scarce supply (U.S. General Accounting Office 1998b).

Second, the alternatives families face may be limited. Not all families have access to care of the entire range of characteristics – stability, quality, as well as cost. Care may be available and affordable, but may not fit parental needs in terms of its quality, stability, and flexibility. Centers, for example, have the most restrictive eligibility criteria and daily schedules (Willer et al. 1991).

Parental preferences comprise a third constraining factor. Economics has not been able to effectively incorporate non-market costs into the framework. Preferences and tastes contribute to determining the value of work and home time (Mason & Kuhlthau 1991). Certainly child age affects parental preferences, with parents preferring informal care such as family child care or relative care for younger children. Availability is also a matter of perception. Differences in choices between parents may reflect cultural values, such as the apparent preference of Hispanic families for relative care over center-based care, all else equal (Fuller et al. 1996). Preference for one type over another is likely to reflect value differences just as much as it reflects price and stability (Marini 1992). If parents have a strong preference for caring for children themselves, when a nonparental arrangement breaks down the next best alternative may entail the mother leaving her job rather than seeking another nonparental arrangement.

Quality of care

Quality of care is an important factor that is expected to affect mothers' decisions through affecting the costs and benefits of work and home time. Here we define a high quality program as one that is linked to positive outcomes for children and satisfaction for parents. Blau (1991) argues that parents may trade off some aspects of care for others in order to maximize their satisfaction with the arrangement. In this paper we focus on three measures of quality: the ratio of children to staff, the stability of the care, and the flexibility of the arrangement.

Child/staff ratio. The ratio of children to staff is an indicator which has been found to be strongly linked to the development of children (Hayes, et al. 1990) and one about which parents are relatively well-informed (Hofferth et al. 1994).[2] Even though the interaction between children and staff was not directly assessed in this study, child/staff ratio is a reasonable proxy. Having more caregivers improves the quality of care because each child receives more adult attention. A lower ratio of children to staff, therefore, may be linked to maternal employment. Being able to obtain more individual attention for her child at a given price should increase the probability of a mother working and reduce the probability of leaving work. Recent research has shown that parents with poor quality care are more likely to leave their jobs than parents with good quality care (Meyers 1993).

Stability. The stability of child care, that is, the frequency of changing child care arrangements, is a second essential element of quality included in this study. Multiple changes in child care arrangements have been found to be associated with high rates of insecure attachment (Suwalsky et al. 1986) and lower complexity of play (Howes & Stewart 1987). Greater stability of care also predicts better school adjustment in first grade (Howes 1988). The stability of child care has been hypothesized to be related to employment stability. Between 10 and 20 percent of families change arrangements in a year (Hofferth et al. 1991; Blau & Robins 1991). In a number of studies, mothers reported that the lack of dependable and reliable child care arrangements affected their ability to remain employed (Bowen & Neenan 1993; Mason & Kuhlthau 1992; Presser & Baldwin 1980). Of course, expressed ex-post-facto justifications for not working or for leaving work may differ markedly from actual instigating or motivating factors. There has been little empirical confirmation of a link between lack or unreliability of care and employment instability. In work by Meyers (Meyers 1994), mothers who had to give up their child care arrangements when they changed activities in California's GAIN program were more likely to drop out of the training program than

those who did not have this discontinuity in child care. However, there is no study that has rigorously examined the relationship between stability of care and employment over time, as the data have heretofore simply not been available.

The type of care appears to be important to employment stability. Informal arrangements such as sitters in the child's home tend to be much less dependable than formal arrangements in centers or in family day care homes. Parents using a sitter in their home reported a greater incidence of losing time from work because the provider was not available than parents using a center or family day care home (Hofferth et al. 1991). Research also shows that those parents with informal arrangements were more likely to report that child care problems prevented work than those with formal center-based arrangements (Siegel & Loman 1991). Because women with less formal care tend to experience less dependable care, and less dependable care is related to higher employment instability, it suggests that women with less formal care will experience more employment exits than women with more formal, and therefore more stable, care. Finally, type of care reflects preferences. Many parents prefer parental care, particularly for young children (Mason & Kuhlthau 1991). While father care may be an ideal way to maintain parental care of young children, only under circumstances where the child's parents live together and have different schedules is sharing care possible (Presser 1989). In addition, such care is not as dependable as other forms. Maume & Mullin (1993) found that women who relied on their husbands for child care were found to be more likely to quit than those relying on a grandmother or other relative. They attribute this to men's resistance to caring for children, leading to less dependable care. It may simply be that the father is temporarily unemployed and the arrangement ends when he finds a new job. Alternatively, employment schedules of one or both partners may change, making the arrangement impractical.

Flexibility of arrangements. A third aspect of quality is flexibility. Research suggests that flexibility is an important correlate of quality from a parent's perspective in that it affects the parent's ability to meet family and work obligations. Flexibility refers to the ability of the parent to make adjustments in child care hours on a day-to-day basis to fit the needs of the job and to similarly adjust work hours when needed to meet child care obligations (Emlen 1998). Our measure of flexibility is whether the respondent uses more than one arrangement during a day or week. Parents often make multiple arrangements to cover their children's care (Eichman & Hofferth 1993; Folk & Yi 1994). The frequent use of multiple arrangements may permit more flexibility and greater ability to adapt to unexpected events, increasing one's

ability to continue working (Emlen 1997; Floge 1985; Spitze 1988). For example a child may go to a center-based preschool program in the morning and to a family day care home in the afternoon. Center-based programs have the most rigid hours and schedules; family day care providers are more flexible (Willer et al. 1991). While multiple arrangements may make managing work and child rearing more complicated (Floge 1985), research has not found the use of multiple arrangements at one point in time to be harmful to children's development (Hayes et al. 1990).

Availability

Given that parents cannot use arrangements which are unavailable; it is surprising that no previous studies have taken the availability of child care into account in examining either maternal employment decisions or choice of child care arrangements. One of the difficulties, of course, is identifying the appropriate unit and obtaining data on supply in that area. This study obtained the number of center-based and home-based programs in the same counties and at the same time parents were interviewed, thus providing a unique opportunity to examine the supply effect.

Another difficulty with an area measure of availability is that the child care decision is highly localized. A county-level measure may be too crude to capture parental access to care. In addition, we do not have a comparable measure for the availability of informal providers such as babysitters and nonregulated family day care homes. Therefore, we also draw upon the respondent's perception of her distance from the nearest center, family day care home, and relative as a measure of the availability or convenience of care.[3]

Community level and policy factors

Characteristics of the local community may be related to women's labor force participation. Because we are interested in child care, we also consider here those measures that are related to child care availability and cost. Research has shown substantial regional variation in the supply of child care programs, with more programs in the South than in other regions (Hofferth et al. 1991). We would expect less employment turnover in areas of greater program supply. Local economic conditions and public policies affect both the labor force participation of mothers and the supply and characteristics of child care. Community attitudes and values towards children, as reflected in the generosity of state expenditures on child care and early childhood services, may also affect labor force participation, child care availability, and cost.

Low-wage mothers

While nonparental child care is generally necessary for mothers to work, it may be an even more critical factor for low-wage mothers, who are more likely than high-wage mothers to be raising children alone (Chilman 1991). A study of the Illinois Aid to Families with Dependent Children (AFDC) population estimated that problems with child care caused 20 percent of AFDC mothers to quit school or a training program in the last 12 months; another 20 percent were estimated to have returned to public assistance because of child care problems (Siegel & Loman 1991). Using cross-sectional data, both Fronstin & Wissoker (1994) and the U.S. General Accounting Office (1995) found a stronger negative effect of child care cost on the work decisions of low-wage compared to high-wage mothers. In contrast, a study by Maume (1991) found no wage difference in the effect of child care expenditures on quitting work.

From a practical perspective, we might expect the employment behavior of low-wage mothers to be more sensitive to the cost of substitutes for the mother's time than that of high-wage mothers. Care of a given cost will take a bigger share of the earnings of a low-wage than of a high-wage mother and her family. Yet, theoretically, our prediction is unclear. On the one hand, low-wage mothers may have access to direct subsidies through vouchers and direct provider payments that are not available to moderate- or high-wage mothers, making the cost of child care lower and the gains from employment higher, net of other factors. On the other hand, moderate- to high-wage mothers have access to indirect subsidies through tax credits available only to those who pay taxes. The evidence to date suggests that, because of direct subsidies, many low-income families have care comparable in quality to that of high-income families, with children from moderate-income families in lower quality care (Hofferth et al. 1994; Whitebook et al. 1989). Failure to find differences in the effects of child care across socioeconomic groups may be due to the offsetting effect of subsidies. This study will explore whether the effects on job exits of child care characteristics such as price, child/staff ratio, stability, flexibility, and accessibility of care vary across mothers of different socioeconomic levels.[4]

Data

The study uses three unique data sets: The National Child Care Survey 1990, a Profile of Child Care Settings, and a Contextual Data file. The availability of data from surveys of parents and providers in the same community at the same

time make it possible to explore the issues described above in an integrated manner.

The *National Child Care Survey* (NCCS) 1990 is a nationally representative sample survey of families with children under age 13, fielded from November 1989 through May 1990. In total, the population includes 27 million families with 47.7 million children. Through random digit dial techniques and computer-assisted telephone interviewing methods, approximately 4,400 households in 144 counties representative of the United States were interviewed by phone (Hofferth et al. 1991). The overall response rate to the survey was 57 percent, not an unusual response rate for a RDD phone survey (Groves & Lyberg 1988). A variety of data quality checks indicate close agreement between the results of this survey and other national surveys conducted in-person and by phone with respect to child care arrangements (Hofferth et al. 1991). The weighted data represent the 1989–1990 population of households with children under 13 in the U.S. The objective of the NCCS was to obtain a comprehensive picture of how families care for their children and make child care choices.

Of importance to the present study, the NCCS obtained a detailed retrospective child care history over the year before the survey date for the youngest child who had not yet entered first grade[5] and an employment history for the mother (and her husband or partner, if present) over the same period.[6] Respondents provided the beginning and ending dates of all child care arrangements.[7] For each arrangement, they reported how much they paid and the reason the arrangement ended. Respondents provided the beginning and ending dates of all jobs held during this period, how much they earned, and the reason they stopped working at that job for both themselves and their partners.

The objective of *A Profile of Child Care Settings* (PCS) was to obtain national estimates of the level and characteristics of early childhood programs available in 1989–1990 for young children through telephone interviews with a representative sample of early education and child care providers (Kisker et al. 1991). The sampling frame consisted of all regulated and nonregulated preschool programs and regulated family day care homes. A survey of providers was fielded by Mathematica Policy Research from October 1989 through February 1990. Using computer-assisted telephone interviewing methods, interviews were conducted with 2,089 center directors and 583 family day care providers in the same 144 counties in which the National Child Care Survey was conducted. These weighted data represent the population of center-based and regulated home-based programs in the U.S. The

response rates for the PCS study were quite high. Interviews were conducted with 89 percent of center programs and 87 percent of home-based providers eligible for the study. The PCS survey obtained detailed information on general administrative characteristics, admission policies, enrollment size, fees and subsidies, staffing, curriculum and activities, health and safety, and operating experiences and expenses.

For the present study, the NCCS provides data on the child care arrangements and characteristics of children and their families while the PCS provides data on the availability and quality of the center-based and regulated family day care homes in each county or group of counties in which these children live. A comparison between information provided in the parent survey (averaged over all preschool children in centers or in family day care homes) and in the provider survey (averaged over all centers or family day care homes) shows that the characteristics reported by parents match those reported by programs, providing support for the validity of these measures (Willer et al. 1991). These data are consistent with information reported by the Census Bureau as well (U.S. Bureau of the Census 1995).

Contextual data file. Using a variety of sources such as the U.S. Bureau of Census, the National Center for Health Statistics, and the Bureau of Economic Analysis, data were obtained for contextual variables in each of the 144 counties in the NCCS. These included family income per capita, the female unemployment rate, and the number of births per 1,000 population. Additionally, in developing the sampling frame for the Profile of Child Care Settings study a complete listing of the number of centers and family day care homes in each county was compiled. This provides an enumeration of the supply of such facilities. Finally, state expenditures on child care and early childhood development services in fiscal year 1990 were obtained from a 50-state survey by the Children's Defense Fund (Adams & Sandfort 1992).

Research methodology

This study employs discrete time logit models to examine the relationship between work exits among employed mothers of preschool children and the constraints of child care.[8] Our model first estimates the log odds of exiting work in a given month as a function of the number and ages of children, the expected birth of a child, job-related characteristics, and the mother's demographic, regional and community characteristics, given that she was employed in the prior month. This basic model is compared to more-complex models which include community child care characteristics, characteristics of mothers' child care arrangements, and changes in those arrangements. Additionally, we test whether the effect of the child care characteristics differ

substantially for low-wage versus high-wage mothers. Because we are interested in a woman's risk of leaving work as a function of factors related to the care of children, only mothers with preschool children were included in the sample, i.e. women at most risk of using child care. Though women with older children may also rely on child care, their ability to use school as a form of free child care weakens the impact of child care factors on these women, leading us to exclude them from study.

Discrete time logit model

This paper uses a discrete-time logit model for three reasons. First, the survey dated events only to the month; thus we do not have continuous histories. Second, discrete time models handle ties without biasing parameter estimates; because we have dates only to the month, many parents exit work at exactly the same time. Third, when the hazard rates are relatively small (in this study, the job exit rate does not exceed 0.10 at any point in time), these models provide a good approximation of the actual hazard rate (Yamaguchi 1991).

Unlike continuous time methods which model the effects of a number of covariates on the hazard of an event occurring, the discrete time method models the effects of covariates on the log of the odds of an event occurring (Allison 1984). In other words, the log odds that an individual exits work between months $t-1$ and t is:

$$\ln(P_{it}/(1-P_{it})) = \alpha + \beta X_i + \phi Z_{it-1}$$

where P_{it} is the probability of individual i not working at month t; X_i is a vector of time-invariant explanatory variables for individual i; Z_{it-1} is a vector of time-varying explanatory variables for individual i at month $t-1$ (which includes duration of the current employment spell)

The results are exponentiated to obtain odds ratios.

The availability of data on the beginning and ending dates of a mother's employment in the past year allows us to estimate the hazard of a woman leaving employment in a particular month. In accordance with the methodology used, the data are organized into records for each month a mother has worked at a particular job. Since the mothers in our sample sometimes held multiple jobs, the primary job was followed throughout the reference period. If there is no observed exit from a job or the job exit was followed by another job within two months, the last month observed is censored, i.e. that month's information is excluded from analysis. Mothers who took a leave of absence from their job were considered continuously employed.

According to human capital theory, as firm-specific investments, i.e., time spent working for a particular firm or in a particular job, increase, then the

benefits from moving to another job decrease and the likelihood of exiting that job decreases (Donohue 1988; Mincer & Ofek 1982; Waite & Berryman 1986). Consistent with these beliefs about job duration, the hazard of leaving employment in a particular month, given that a mother of preschool children has survived to the previous month, decreases over time. In this general decline, a significant peak appears at the third month, indicating the rapid departure of those for whom the job was not a good match (Donohue 1988). For these reasons, job duration and a dummy variable indicating whether it is the third month on the job are included in the logistic model.[9] The actual starting date of employment spells in progress at the beginning of the 12-month observation period is known. Consequently, we are able to control for total duration in the job, even for those spells which were ongoing at the beginning of the observed period, thus eliminating problems associated with left-censored data.

Since we are interested in mothers who leave a job rather than those who simply switch from one to another, the dependent variable is a dichotomous variable equaling one if a mother leaves her job in the current month (and does not take another for at least 2 months) and zero if she remains employed (or switches jobs). To consider a job exit to have been caused by child care characteristics or child care instability, the job exit cannot be planned in advance.[10] The survey asked mothers why they left their jobs. The distribution of responses is shown in Table 1. In eleven percent of exits mothers stated that they left their jobs because they moved, in 2 percent mothers said it was because they returned to school, and in 11 percent of job exits mothers reported that the job had been a temporary one. Besides the models presented here, which include all reasons for leaving, we ran the models treating jobs that ended due to a geographic move, returning to school, or a temporary position (and therefore had a known length of time) as censored in the month they left work. We also ran them with schooling and moves censored and temporary spells of employment excluded. The models differed very little, so results are not presented here.

One of the important features of event history analysis is the ability to incorporate time-varying covariates into a model. All time-varying covariates are measured at the closest known time before the event is at risk of occurring (i.e., a mother exits a job). Job duration and whether a mother holds another job are time-varying characteristics, varying from month to month. Marital status, pregnancy status, age of the youngest child, and number of children less than 13 years old are also time-varying covariates, measured at the start of each month. Hourly wage and hours worked per week are job-specific, varying by job, not by month worked. Since data were collected on the starting and ending dates of child care arrangements, the child care type and cost

Table 1. Characteristics of the jobs in the sample

	No. of jobs	Percent of sample
Number of jobs in the sample	1,877	
Number of jobs ending during reference year	412	100%
Reasons given by mothers for ending job in reference year		
Prefer not while children are young	53	13%
Child care problems	20	5%
Couldn't afford child care	2	0%
Got pregnant/had a child	47	11%
Started having to stay home with other dependents	5	1%
Own illness/health reasons	12	3%
Fired/laid off	40	10%
Did not make enough money	29	7%
Did not like job	37	9%
Husband didn't like wife working	2	0%
Relocated/moved	44	11%
Return to school/job training	9	2%
Temporary employment	46	11%
Other	60	15%
Refused	6	1%

can vary during the spell. Information about the main care arrangement (the one used for the greatest number of hours) in the prior month was used. The other variables in our model are measured at the survey date.

Measure of wages and hours worked

Approximately 11 percent of the jobs were missing values for hours worked per week and 18 percent were missing values for hourly wages. If information was missing on the number of hours worked at a particular job, the mean number of hours worked for the sample of jobs was used. The hourly wage was imputed for jobs with missing values using predicted values from a regression of the log wage on the mother's demographic and family characteristics, area of residence, area per capita income, area unemployment rate, type of occupation, and type of industry (not shown). A dummy variable was included in the event history models to identify the use of an imputed value for wages.

Measurement of child care characteristics: price, quality, availability

We can imagine at least two different levels at which to measure child care characteristics that affect family decisions regarding employment – the area level and the individual level. First, using market price as the example, parents learn about the going rate in the local child care market by calling providers or by asking friends and relatives (Hofferth et al. 1998). When they lose an arrangement, the local market price may determine whether they are able to afford another arrangement or have to quit. Second, mothers who already have an arrangement may find that the fee rises relative to their wage until it becomes unaffordable and they decide to stay home. While mothers who already have an arrangement may be influenced by the fee they are currently paying, in making decisions when a provider becomes ill or quits, area prices may be more important. What parents pay should reflect area prices; however, the two need not be the same.

What parents pay results from a set of decisions parents have already made; thus, the payment may be endogenous to other choices. For example, mothers who take a temporary job may select a form of care that is less costly and less stable. When it fails and the mother stops working, we cannot determine whether this is the fault of the arrangement or of decisions made based upon the temporary nature of the job situation in the first place. Area measures are likely to be more exogenous to family choices than individual measures. We had access to characteristics of child care arrangements, such as prices, measured at both the individual and community levels. Since they measure the same concept, both are not included in the same model.

Individual level. At the individual level, the set of measures reflects the characteristics of the primary child care arrangement of the youngest child in each family each month, as reported by the mother. This includes whether they have a nonparental arrangement, the primary type of care used – center care, family day care, relative care, and care by the other parent; their expenditures for care – its 'cost'; and the perceived distance from their home to available care of each type in the area – its 'availability' or 'convenience'. Since parents were not asked about the number of children and staff in programs they are not currently using but may have used over the previous year, we were unable to include a measure of child/staff ratio at the individual level.

Instability of care is measured by the termination of a child care arrangement. We look at child care arrangements which end in the month prior to the reference month in order to avoid including child care ends which result from the termination of a job.[11] As a measure of flexibility, the study determined whether the parent had only one child care arrangement or had several child care arrangements at the beginning of the reference month, hypothesizing

that having several arrangements increases parental flexibility and, therefore, reduces job exits.

Area level. Data from the Profile of Child Care Settings were used to create measures of the number and characteristics of centers and family day care homes in the counties in which the families reside.[12] A similar method was used by Stolzenberg & Waite (1984). The average fees paid by families in each county in the study for center-based care and family day care serve as measures of area child care costs. Average child/staff ratios in each county for center-based care and family day care serve as measures of quality of care available to the mother; the higher the ratio of children to staff, the lower the quality of care provided. Finally, the sampling frame for the Profile of Child Care Settings provides estimates of the number of center-based care arrangements and licensed family day care homes, which we have standardized by dividing by the number of children less than six years old in the same county. While these two forms of care are not comprehensive, they constitute a substantial fraction, about half, of the child care market. In addition, since informal child care responds quickly to demand, only the size of the formal sector is expected to influence use. The larger the number of such arrangements available in an area, the more convenient it would be for the mother to obtain child care in her area were she to seek it.

Community and policy variables

To ensure that the variables of interest in our model do not merely reflect differences in local economic conditions, we control for a set of area characteristics that may affect either the supply and characteristics of child care or the labor force participation of mothers (and thus the demand for child care). On the supply side, regional dummies control for differences between regions, and central city and suburb (compared with rural) dummies control for urban-rural differences. County income per capita is included to control for area differences in the cost of living, which may affect both child care prices and wage rates. The level of state expenditures per child on child care and early childhood services is an indicator of differences in community attitudes and values towards children, reflecting the degree of generosity towards families with children. Several variables represent the demand side. The generosity of welfare benefits, net of the cost of living, is an indicator of the attractiveness of home time compared with work time. The number of births per 1,000 residents measures the prevalence of mothers and children in the population, and, therefore, the potential demand for child care. Finally, female unemployment rates reflect the extent of employment opportunities for women in the area. Where unemployment is high, we would expect more

stability in employment, as mothers will hesitate to voluntarily leave a secure job when opportunities to find another are limited.

Results

Descriptive statistics

For this study, mothers of preschool children who were employed at any time during the reference period – the year prior to the survey date – were selected for analysis. These sample selection criteria leave us with 1,565 women for analysis (Table 2). Eighty-one percent of these women held only one job throughout the year of interest. Nineteen percent were observed holding two or more jobs during this period. Twenty-four percent of the women left at least one job within this period.[13] Fifteen percent (62.5 percent of the total leaving) left a job and did not return for two months. The average woman in the sample was 30 years old, had completed some college, and had thus far acquired approximately ten years of work experience since her eighteenth birthday. She had two children, with the youngest aged two years old. Most (85 percent) were married for at least part of the observation year. Of these 1,565 women, forty-nine percent used one child care arrangement within the year. Another nineteen percent used two child care arrangements, while five percent held three or more arrangements within the year. Approximately 17 percent of the women in our sample terminated a child care arrangement during the reference period.

The models

We first present the results from the basic model, Model 1 (Table 3). This model estimates the effects of the number and ages of children, the birth of a child, job characteristics, personal and family characteristics, area of residence, and macroeconomic factors on the log odds of a mother leaving her job that month. We then add the characteristics of the child care arrangement. In Model 2 we add area child care characteristics, and in Model 3 we add individual child care characteristics. We first examine whether the effect of children on job leaving declines once child care is added. We then examine the effect of care characteristics. Mothers who face more costly, less available, and lower quality child care are expected to be more likely to leave their jobs than those with less costly, more available, and higher quality care. We expect that the stability of child care arrangements will positively affect the continuity of mothers' employment. Model 4 tests this hypothesis by adding information about child care endings in the previous months to the basic model.[14]

Table 2. Weighted characteristics of the mothers in the sample (standard deviations)

Job characteristics	
Proportion who held only 1 job in year	0.81 (0.4)
Proportion who held more than 1 job in year	0.19 (0.4)
Proportion who left a job within year	0.24 (0.43)
Proportion who left a job for more than 2 months within year	0.15 (0.36)
Child care characteristics	
Proportion with no child care arrangements in the year	0.27 (0.44)
Proportion with only 1 child care arrangement in the year	0.49 (0.5)
Proportion with 2 child care arrangements in the year	0.19 (0.4)
Proportion with 3 or more child care arrangements in the year	0.05 (0.22)
Proportion who ended child care arrangement in year	0.17 (0.38)
Women's characteristics	
Average grade completed	13.49 (2.27)
Average years of work experience since 18	10.09 (5.49)
Average yearly earnings	$15,755 (21,927)
Average household income	$38,499 (26,855)
Average age	30.37 (5.48)
Average age of youngest child	2.27 (1.65)
Average number of children less than 13 years old	1.81 (0.84)
Proportion married during year	0.85 (0.35)
Proportion with adult other than spouse in household	0.06 (0.24)
Proportion who were pregnant in the year	0.17 (0.37)
Proportion who moved within the year	0.23 (0.42)
Race	
Proportion white	0.76 (0.43)
Proportion black	0.13 (0.34)
Proportion Hispanic	0.09 (0.29)
Proportion other	0.02 (0.13)
Region	
Proportion in south	0.37 (0.48)
Proportion in west	0.20 (0.4)
Proportion in midwest	0.25 (0.43)
Proportion in north	0.19 (0.39)
Urbanicity	
Proportion in central city	0.41 (0.49)
Proportion in suburbs	0.34 (0.47)
Proportion in rural areas	0.25 (0.43)

Table 2. (continued)

Economic characteristics	
Average maximum state AFDC benefit	$401 (155)
Per capita income, 1987	$15,423 (3,628)
Female unemployment rate, 1980	6.77 (2.59)
Crude birth rate	15.03 (2.29)
State expenditures on children's services per child	$41 (30)
Area child care characteristics	
Average hourly fees for center-based care	$1.58 (0.48)
Average hourly fees for family day care	$1.45 (0.47)
Child:staff ratios for center-based care	8.63 (1.19)
Child:staff ratios for family day care	5.45 (1.66)
Average number of centers per 1,000 children	4.76 (2.39)
Average number of family day care homes per 1,000 children	8.71 (8.03)
Sample size	1,565

Basic model: the effects of job, mother's, family, and area characteristics on work exits

Model 1 is statistically significant. There is a significant decrease in the log likelihood for the model with these twenty-nine variables compared to the log likelihood of a model with only the intercept (-2 difference in log $L = 239.9$, $p < 0.01$, $df = 29$). In Table 3 we present the estimated coefficients for Model 1.

Effects of job-related variables. In general, job and demographic variables indicating greater labor force attachment and better job prospects decrease the odds of an employment exit. Consistent with our expectations, as a woman accrues more job-specific capital, the likelihood of a job exit declines. This is demonstrated by the significant negative effect of the cumulative number of months worked since the start of the job on the likelihood of leaving.[15] The log odds of a mother leaving her current employment decline by 1.3 percent for each month previously worked at that job. The exception is that in the third month on the job the log odds of leaving increase by 127 percent, reflecting the exit of mothers who were mismatched to the current job.[16] In other words, if a woman survives to the 12th month of employment, her cumulative odds of leaving decrease by 14.5 percent, while if a woman survives to her 24th month, her odds of leaving decrease by 26.8 percent.[17]

Table 3. Estimated coefficients for log odds of exiting paid work for more than two months

Variable description	Sample mean (s.d.)	Model 1 β	Model 1 Odds ratio	Model 2 β	Model 2 Odds ratio	Model 3 β	Model 3 Odds ratio	Model 4 β	Model 4 Odds ratio
Intercept		−1.180	0.307	−0.429	0.652	−2.194	0.111*	−0.989	0.372
Characteristics of the job									
No. of months worked at current job	4.250 (4.216)	−0.013	0.987***	−0.013	0.987***	−0.012	0.988***	−0.012	0.988***
The 3rd month in job (1 = yes)	0.030 (0.17)	0.819	2.269***	0.827	2.286***	0.816	2.260***	0.818	2.267***
Holds at least 1 other job? (1 = yes)	0.052 (0.221)	0.422	1.525	0.464	1.590	0.464	1.590	0.462	1.587
Hours per week worked at job	35.258 (13.559)	−0.009	0.991*	−0.010	0.990*	−0.006	0.994	−0.007	0.993
Hourly wage earned for this job	11.399 (17.067)	0.004	1.004	0.004	1.004	0.004	1.004	0.004	1.004
Hourly wage missing for this job		−0.619	0.538**	−0.588	0.555**	−0.630	0.532**	−0.615	0.541**
Mother's demographic characteristics									
Age in years	30.554 (5.415)	−0.033	0.968*	−0.033	0.968*	−0.038	0.963**	−0.036	0.965*
Highest grade completed	13.643 (2.146)	−0.126	0.881***	−0.128	0.880***	−0.113	0.893***	−0.118	0.889***
Currently married? (1 = yes)	0.831 (0.375)	−0.422	0.656*	−0.427	0.653*	−0.428	0.652*	−0.472	0.624**
Number of children less than 13 years	1.732 (0.808)	0.157	1.170*	0.151	1.163*	0.127	1.136	0.149	1.161*
Age of youngest child in months	30.552 (18.582)	−0.008	0.992*	−0.008	0.992*	−0.006	0.994	−0.007	0.993*
Pregnant approx. 5 to 7 months? (1 = yes)	0.018 (0.134)	1.261	3.527***	1.317	3.732***	0.901	2.461**	1.028	2.796***
Pregnant approx. 8 to 9 months? (1 = yes)	0.015 (0.12)	1.753	5.773***	1.794	6.016***	1.438	4.213***	1.510	4.528***
Gave birth in current month? (1 = yes)	0.007 (0.085)	2.788	16.246***	2.835	17.032***	2.506	12.255***	2.551	12.814***
Respondent is black? (1 = yes)	0.102 (0.302)	−0.009	0.991	0.002	1.002	−0.012	0.988	−0.026	0.975
Respondent is Hispanic? (1 = yes)	0.080 (0.271)	0.135	1.144	0.112	1.118	0.157	1.170	0.157	1.170
Respondent is other (excludes whites)?	0.025 (0.157)	−1.105	0.331	−1.145	0.318	−1.105	0.331	−1.129	0.323

Table 3. (continued)

Variable description	Sample mean (s.d.)	Model 1 β	Model 1 Odds ratio	Model 2 β	Model 2 Odds ratio	Model 3 β	Model 3 Odds ratio	Model 4 β	Model 4 Odds ratio
Household characteristics									
Other household income (per $1,000)	$28.16 (22.28)	0.015	1.015***	0.016	1.016***	0.016	1.016***	0.015	1.015***
Presence of other adults in household?	0.064 (0.244)	−1.028	0.358**	−0.992	0.371**	−1.048	0.351**	−1.008	0.365**
Area factors									
Live in west? (1 = yes)	0.173 (0.379)	0.414	1.513	0.448	1.566	0.482	1.619*	0.447	1.564*
Live in midwest? (1 = yes)	0.293 (0.455)	0.261	1.298	0.381	1.464	0.316	1.371	0.270	1.310
Live in the north? (1 = yes)	0.185 (0.388)	0.312	1.366	0.460	1.584	0.246	1.279	0.312	1.366
Live in a central city? (1 = yes)	0.396 (0.489)	0.165	1.179	0.082	1.085	0.179	1.196	0.165	1.179
Live in a suburb? (1 = yes)	0.341 (0.474)	0.090	1.094	0.011	1.011	0.222	1.249	0.122	1.129
Max. AFDC benefits for 3-person family	$399.5 (147.6)	−0.001	0.999	−0.001	0.999	−0.001	0.999	−0.001	0.999
Per capita personal income, 1987	15,441 (3596)	0.000	1.000	0.000	1.000	0.000	1.000	0.000	1.000
Female civilian unemployment rate, 1980	6.74 (2.64)	0.024	1.024	0.018	1.018	0.018	1.018	0.018	1.018
Births per 1,000 population, 1984	14.92 (2.23)	0.029	1.030	0.032	1.032	0.024	1.024	0.030	1.030
Total expenditures per child on services	$40.62 (28.02)	0.000	1.000	0.001	1.001	0.001	1.001	0.000	1.000
Characteristics of the area child care									
Avg. hourly fees for center-based care	1.58 (0.46)			−0.323	0.724				
Avg. hourly fees for family day care (FDC)	1.44 (0.45)			−0.281	0.755				
Child:staff ratio for center-based care	8.63 (1.19)			0.020	1.020				
Child:staff ratio for family day care	5.48 (1.67)			−0.071	0.932				
Number of centers per 1,000 children	4.89 (2.58)			−0.049	0.952				
Number of FDC homes per 1,000 children	8.86 (8.3)			0.009	1.009				

Table 3. (continued)

Variable description	Sample mean (s.d.)	Model 1 β	Model 1 Odds ratio	Model 2 β	Model 2 Odds ratio	Model 3 β	Model 3 Odds ratio	Model 4 β	Model 4 Odds ratio
Characteristics of the mother's child care									
Parental care in prior month?	0.38 (0.48)					0.792	2.207**		
Center care in prior month?						*omitted category*			
Family day care in prior month?	0.16 (0.36)					−0.254	0.776		
Sitter care in prior month?	0.05 (0.22)					0.294	1.341		
Relative care in prior month?	0.18 (0.38)					0.390	1.477		
Other care in prior month?	0.01 (0.1)					0.785	2.193		
Cost of primary care in prior month?	0.77 (1.3)					0.088	1.092		
Cost of primary care missing?						0.311	1.364		
Closest center within 10 minutes?						*omitted category*			
Closest center within 10 to 30 minutes?	0.30 (0.46)					0.604	1.828***		
Closest center farther than 30 minutes?	0.25 (0.43)					0.421	1.524**		
Proximity of closest center missing?	0.01 (0.11)					0.407	1.502		
Closest FDC within 10 minutes?						*omitted category*			
Closest FDC within 10 to 30 minutes?	0.14 (0.35)					−0.066	0.936		
Closest FDC farther than 30 minutes?	0.48 (0.5)					0.065	1.067		
Proximity of closest FDC missing?	0.01 (0.12)					−0.855	0.425		
Closest relative within 10 minutes?						*omitted category*			
Closest relative within 10 to 30 minutes?	0.19 (0.39)					−0.285	0.752		
Closest relative farther than 30 minutes?	0.43 (0.5)					0.190	1.209		
Proximity of closest relative missing?	0.01 (0.1)					0.163	1.177		

Table 3. (continued)

Variable description	Sample mean (s.d.)	Model 1 β	Model 1 Odds ratio	Model 2 β	Model 2 Odds ratio	Model 3 β	Model 3 Odds ratio	Model 4 β	Model 4 Odds ratio
Child care arrangement ended in prior month?	0.01 (0.12)							0.574	1.775
Have 1 arrangement at start of current month?	0.49 (0.5)							−0.410	0.664**
More than 1 arrangement at start of month?	0.13 (0.34)							−0.763	0.466**
Degrees of freedom	15,207		14099		14093		14083		14096
−2 Log likelihood			2113.3		2106.0		2074.5**		2100*

* $p \leqslant 0.05$; ** $p \leqslant 0.01$; *** $p \leqslant 0.001$ for one-tailed significance tests (Tests for −2 Log L compared to Model 1).

The hourly wage obtained for the job was not found to significantly impact the odds of exiting work. While it is surprising that the hourly wage is not related to the probability of job exits, many of the important factors that are related to a women's wage rate, such as age and education, are already included in the model. When education is omitted, the wage rate is significantly related to job exits. Missing information for observed hourly wages is associated with a significantly lower rate of exit.

Variables decreasing the costs of working, such as the presence of other adults in the household, lower the odds of exiting and variables decreasing the cost of staying home, such as higher family income, increase the odds of an employment exit. These results are shown in Table 3, but are not described here in order to focus on the effects of children and child care.

Effects of children. The number and ages of children appear to constrain the ability of a mother to remain employed. Mothers with a larger number of children and younger children are more likely to leave their jobs than other mothers. Each additional child increases the odds of exiting a job by 17 percent and for each month of (child's) age, the odds of exiting increase by 1 percent. These effects, while significant, are not very strong. This is because the effects are concentrated in the first year of the child's life. More than half of mothers are back at work within the first year (Hofferth 1996).

The effects of children are strongest around the time of birth. Being pregnant or having just given birth is very strongly associated with leaving the work force, as expected. A women who is still working during her fifth to seventh months of pregnancy is 3.5 times as likely to leave her current employment for more than two months than a woman who is not pregnant or who is less than 5 months pregnant. The odds of exiting the current job increase to 5.8 if a women is still working in her eighth to ninth month of pregnancy, and the odds reach 16.2 when a women works up until the birth month.[18] These measures of fertility were included as a means of identifying how child care mediates the effects of childbearing on job exits. The results clearly demonstrate the importance of childbearing to women's employment exits. In the next section we add child care characteristics to the model.

Effects of child care characteristics

Effects of area care characteristics. Adding area child care characteristics (Table 3, Model 2) does little to improve the overall fit of the model (-2 difference in $\log L = 7.3$, $p > 0.05$, $df = 6$). None of the characteristics of child care in the area – fees, average child/staff ratios, or number of programs – appears to significantly affect the exit probabilities of the mothers in our

sample. This may be because county area measures do not adequately capture the real child care market mothers face at the neighborhood level.

Effects of individual care characteristics. In Table 3, Model 3, area characteristics are replaced with characteristics of the arrangements parents actually use or know about, based upon their own individual reports. Adding these characteristics significantly improves the fit of the model (-2 difference $\log L = 38.7$, $p < 0.01$, $df = 16$). Though actual child care expenditures do not seem to affect leaving a job, type of care and convenience do. Mothers using only parental care are 2.2 times more likely to leave a job than mothers using center-based care. This is consistent with other research showing that women who relied on their husbands to provide child care while they were employed were more likely to quit work than those who relied on a grandmother or another relative (Maume & Mullin, 1993). Convenience as measured by distance to care is an important aspect of child care; however, this is only apparent for center-based care. Mothers who report that a center is 10 or more minutes away are more likely to leave the work force than those who report that a center is within 10 minutes from home.

Net effects of children, controlling for child care. The mother's current child care arrangements mediate the constraints of having children on job leaving. Adding the mother's current child care arrangements to the basic model reduces by 20 percent to 25 percent the negative effect of having numerous and young children on job stability. Both effects lose statistical significance. This demonstrates the job stabilizing effects of having available and convenient child care. Child care not only mediates the effects of children already present, but also the effects of expecting an additional child, as evidenced by the slightly lower estimates of the effects of pregnancy and childbirth on job exits after adjusting for child care characteristics.

Effect of child care instability and flexibility on work exits

In Table 3, Model 4, we add child care instability and number of arrangements to the basic model. These additions improve the model significantly (-2 difference $\log L = 13.4$, $p < 0.05$, $df = 3$). Contrary to expectation, our measure of child care instability has no significant effect on the job stability of mothers of preschool children. The effect of a child care arrangement ending in the prior month is in the expected positive direction but is not significantly associated with the odds of a work exit.

The presence of one or more child care arrangements (compared with having no nonparental arrangements) is associated with a significantly decreased risk of leaving the present job, as expected.[19] From this we conclude that what

is important to job stability is not leaving a nonparental arrangement per se, but retaining at least one. The odds that mothers who retain one child care arrangement will leave their present job are 34 percent lower than those of mothers who have no child care arrangement. Mothers who retain multiple child care arrangements are slightly but not significantly *less* likely to leave their present jobs than those with one child care arrangement at the beginning of the reference month.

Interaction between the effects of maternal wage and children on work exits

While we found no direct wage effects, there may still be an interaction between the effects of children and maternal wages on job leaving. The next set of analyses examines whether the effect of children and child care on work exit differs by level of socioeconomic advantage. Socioeconomic advantage was determined by calculating the mother's *potential* wage, given her socioeconomic characteristics (see Fronstin & Wissoker, 1994).[20] Low-wage mothers could potentially earn less than $6 per hour (approximately the poverty line for a family of four, if working full-time, year-round in 1990). Moderate-wage mothers could potentially earn between $6 and $8 per hour (approximately 100 to 133 percent of the poverty line). High-wage mothers could earn more than $8 per hour.[21] Logistic models were run separately for each income group. Significance tests of interactions between income classification and child care variables were conducted with multiplicative effects added to the entire sample (not shown). Only significant differences ($p < 0.05$, two-tailed test) are described in the text.

Effects of childbearing by maternal wage

The effect of children on the probability of work exit differs by maternal wage, a difference that holds across the three models in Panels A, B, and C of Table 4. Consistent with our expectation that the cost of care declines as children age, it is not the number of children (which is not significantly related to job exits in these models) but the age of the youngest that is important. The negative effect on job exits of having an older preschool child is large and significant for moderate-wage mothers while the effects for low- and high-wage mothers are small and insignificant. Being pregnant appears to affect women with low potential wages differently from those with moderate or high potential wages. At each stage of pregnancy, mothers with moderate to high potential wages are more likely to exit from work than mothers with low potential wages. Among low-wage mothers, only having just given birth is associated with a higher chance of leaving one's job. The employment response to pregnancy of women with low potential wages appears to be more

inelastic than those with higher potential wages. Since the responsiveness of low-wage mothers to the age of the youngest child is also small, this suggests that the employment of low-wage mothers is less responsive to childbearing and rearing than that of moderate- and high-wage mothers; the necessity of working is greater for the former.

Effect of child care by maternal wage

Child care stability. The top panel (A) of Table 4 shows the effects of adding the instability of child care arrangements to the same basic model containing demographic factors, number and ages of children, and pregnancy variables as in Table 3, but run separately for each income grouping. In general, the employment exits of low-wage mothers appear to be insensitive, while those of moderate- and high-wage mothers are quite sensitive to the ending of a child care arrangement. Specifically, when looking at the exit probabilities of mothers broken down by potential wages, one sees that the termination of a child care arrangement has no effect (a negative effect that is not significant) on the likelihood of a mother with low potential wages leaving her job. In contrast, for mothers with medium and high potential wages, child care termination is positively related to a work exit. The reason for the failure to find an effect of child care instability on work exits in the full sample is the different direction of the effect for low-wage compared with moderate- to high-wage mothers.

Flexibility. The effects of having one arrangement are consistently negative across all socioeconomic status groups, though significantly related to job exits only for low- and high- wage mothers. The effects of having more than one arrangement are also negative. For low- and moderate-wage mothers, having multiple arrangements reduces job exits significantly more than having only one (tests not shown). This is not the case for high-wage mothers. Multiple arrangements appear to provide some additional flexibility for low- and moderate-wage mothers that single arrangements do not provide.

Area child care characteristics. The middle panel (B) of Table 4 adds area child care characteristics for each high-, moderate-, and low-wage group to the basic model in Table 3. Women with low potential wages do not appear more sensitive than mothers with high potential wages to the quality or availability of area child care, but they are more sensitive to the average price of center care in the area. For low-wage mothers, a higher average price for center-based care in the area is associated with a marginally lower risk of exiting work. For moderate-wage mothers, a higher average price of family day care is associated with a lower likelihood of leaving employment. Based

Table 4. Estimated coefficients by wage categories for variables added to basic model

Variable description	Potential hourly wage < $6		Potential hourly wage $6 to $8		Potential hourly wage > $8	
	β	Odds ratio	β	Odds ratio	β	Odds ratio
Panel A: Model 1 + instability measures						
Characteristics of the mother's family constraints						
Number of children less than 13 years	0.189	1.208	0.009	1.010	0.107	1.113
Age of youngest child in months	−0.002	0.998	−0.023	0.977**	−0.003	0.997
Pregnant approx. 5 to 7 months? (1 = yes)	0.656	1.928	1.717	5.567**	1.472	4.356**
Pregnant approx. 8 to 9 months? (1 = yes)	0.002	1.002	2.693	14.775***	2.020	7.536***
Gave birth in current month? (1 = yes)	2.048	7.755***	3.415	30.418***	2.702	14.910***
Instability and flexibility measures						
Child care arrangement ended in prior month?	−0.994	0.370	1.423	4.150*	1.397	4.044*
Have 1 arrangement at start of current month?	−0.395	0.673*	−0.046	0.955	−0.988	0.372**
Have more than 1 arrangement at start of month?	−1.070	0.343*	−1.448	0.235*	−0.074	0.928
Panel B: Model 1 + area child care characteristics						
Characteristics of the mother's family constraints						
Number of children less than 13 years	0.188	1.206	0.013	1.013	0.136	1.146
Age of youngest child in months	−0.004	0.996	−0.022	0.978**	−0.005	0.995
Pregnant approx. 5 to 7 months? (1 = yes)	1.081	2.949*	1.871	6.493**	2.031	7.621***
Pregnant approx. 8 to 9 months? (1 = yes)	0.386	1.471	2.800	16.439***	2.580	13.190***
Gave birth in current month? (1 = yes)	2.438	11.454***	3.482	32.528***	3.290	26.928***

Table 4. (continued)

Variable description	Potential hourly wage < $6		Potential hourly wage $6 to $8		Potential hourly wage > $8	
	β	Odds ratio	β	Odds ratio	β	Odds ratio
Characteristics of the area child care						
Avg. hourly fees for center-based care	−1.214	0.297*	0.582	1.790	0.307	1.360
Avg. hourly fees for family day care (FDC)	−0.458	0.632	−1.042	0.353*	0.557	1.746
Child:staff ratio for center-based care	−0.046	0.955	−0.022	0.978	0.184	1.203
Child:staff ratio for family day care	−0.104	0.901	−0.139	0.870	−0.102	0.903
Number of centers per 1,000 children	0.000	1.000	−0.156*	0.856*	−0.087	0.917
Number of FDC homes per 1,000 children	0.010	1.010	0.018	1.018	−0.011	0.989
Panel C: Model 1 + individual child care characteristics						
Characteristics of the mother's family constraints						
Number of children less than 13 years	0.185	1.203	−0.038	0.963	0.085	1.088
Age of youngest child in months	0.000	1.000	−0.026	0.974**	−0.005	0.995
Pregnant approx. 5 to 7 months? (1 = yes)	0.661	1.936	1.556	4.747**	1.262	3.533*
Pregnant approx. 8 to 9 months? (1 = yes)	0.002	1.002	2.688	14.696***	2.069	7.919***
Gave birth in current month? (1 = yes)	1.969	7.164**	3.556	35.017***	2.853	17.332***
Characteristics of the mother's child care						
Parental care in prior month?	0.541	1.718	1.058	2.880*	0.781	2.185*
Center care in prior month?						

Table 4. (continued)

Variable description	Potential hourly wage < $6		Potential hourly wage $6 to $8		Potential hourly wage > $8	
	β	Odds ratio	β	Odds ratio	β	Odds ratio
Family day care in prior month?	−0.867	0.420	−0.053	0.949	−0.849	0.428
Sitter care in prior month?	0.792	2.207	−2.091	0.124	0.910	2.485
Relative care in prior month?	0.314	1.369	0.715	2.044	−0.370	0.691
Cost of primary care in prior month	0.039	1.040	0.340	1.405***	−0.019	0.982
Cost of primary care missing?	0.059	1.061	0.986	2.680*	−0.018	0.982
Closest center within 10 minutes?						
Closest center within 10 to 30 minutes?	0.504	1.656*	0.546	1.726	0.996	2.707**
Closest center farther than 30 minutes?	0.425	1.530	0.432	1.539	0.241	1.272
Closest FDC within 10 minutes?						
Closest FDC within 10 to 30 minutes?	−0.201	0.818	0.974	2.648**	0.029	1.029
Closest FDC farther than 30 minutes?	−0.009	0.991	0.455	1.577	0.218	1.244
Closest relative within 10 minutes?						
Closest relative within 10 to 30 minutes?	0.186	1.205	−0.353	0.703	−2.429	0.088**
Closest relative farther than 30 minutes?	0.466	1.594*	0.205	1.228	−0.393	0.675

* $p \leqslant 0.05$, ** $p \leqslant 0.01$, *** $p \leqslant 0.001$, one-tailed test.

upon these results, we can reject our hypothesis that higher priced care in an area increases employment exits. These results appear counter to common sense. However, if the average price of child care in an area is also a measure of quality of care (higher cost implies higher quality), then this measure could be picking up the effects of quality of care on the likelihood of a low-wage mother exiting employment. Given our limited measurement of area program quality, it is likely that price is picking up unmeasured aspects of quality. The child/staff ratio was not associated with job exits for any of the mothers.

Greater availability of programs, as measured by the number of centers per 1,000 children, is associated with a lower probability of job exit for moderate-wage but not for other mothers. This finding supports our hypothesis that availability or ease of finding center care is associated with a lower probability of exiting a job, but only for moderate-wage mothers.

Individual child care characteristics. The third panel (C) of Table 4 shows the relationship between individual care characteristics and job exits, by mother's wage group, adjusting for the variables in the basic model of Table 3. Mothers whose children are in parental care are more likely to leave their jobs than are mothers with children in center care, a relationship stronger for mothers receiving medium or high wages than for mothers receiving low wages.

Table 4 provides evidence that one reason parental child care expenditures were not significantly related to job exits for all mothers is that their impact is not the same across income groups. High expenditures on child care are related to leaving a job for mothers with moderate but not low or high wages. High-wage mothers do not need to worry about the cost and low- wage mothers may benefit from subsidies. For example, in the last observed working month, average child care costs for low-wage mothers averaged about 7.5 percent of the average actual wage. Those of high-wage mothers averaged about 6.5 percent of their average actual wages. In contrast, the child care costs of moderate-wage mothers averaged about 9.1 percent of their average actual wages, higher than the child care costs of either of the other two groups.

The effect of the perceived availability of care varies by income group. Both high- and low-wage mothers' jobs are more sensitive to the availability of center care than are those of moderate-wage mothers, who are more sensitive to the availability of family day care. Those who are farther away from potential care arrangements are more likely to leave their jobs. Low-wage mothers are most sensitive to the availability of relative care. For such mothers, not having a relative within 30 minutes is associated with an increased likelihood of leaving a job. One anomalous finding is that high-wage mothers with relatives within 10 to 30 minutes are less likely to leave a job than those with relatives within 10 minutes. Perhaps 10 to 30 minutes is not a major

barrier for high-wage mothers in need of child care, with their easy access to transportation.

Summary and conclusions

This paper has focused upon the ways in which childbearing and childrearing affect the ability of a mother to maintain stable employment. The results suggest that maternal ability to maintain a stable work pattern is much more strongly associated with the availability and characteristics of substitute arrangements than previously demonstrated. As have other studies, the results show that mothers with a larger number of children, young children, and who are pregnant or have recently given birth are more likely to exit their job in any given month. These results also show that the use of nonparental care and the availability of center-based care explain some of the differential rate with which mothers with young children exit employment, controlling for the characteristics of the mother, her family, and her location. Not having a formal nonparental arrangement is associated with greater job exits. In addition, mothers who do not have convenient access to a center-based program are more likely to leave their jobs.

We found substantial differences in the effects of children on maternal job exits by maternal wage level, with low-wage mothers who have a young child or who are pregnant less likely to leave a job. This finding is consistent with the argument that such mothers face greater constraints on their employment behavior and different options for child care.

We found substantial differences in the effects of child care characteristics on mothers with different levels of socioeconomic advantage, measured by their individual potential wage. Income group differences in level and direction of relationships, which offset each other, suppress significant effects in the entire sample.

Area child care characteristics. The availability of child care is clearly one of the most important factors related to job stability. A greater number of centers per 1,000 children was associated with a lower probability of job exit for moderate-wage mothers, as expected. Contrary to expectations, higher area fees for center-based care and for family child care were associated with a lower probability of leaving a job for low- and moderate-wage mothers, respectively. This suggests that fees may represent the unmeasured quality of programs in the area.

Individual child care characteristics. The effects of individual child care characteristics on job exits among mothers grouped by socioeconomic advantage

are similar to those of area characteristics. First, availability of care is clearly a key factor influencing mothers' job stability. Mothers who have to travel more than 10 minutes to the closest arrangement are more likely to leave their jobs than mothers who live within 10 minutes. The availability of centers is more important for the least and most advantaged mothers; the availability of family day care is more important for moderately advantaged mothers. The availability of relative care is also important for low-wage mothers' work stability. This makes sense; low-wage mothers rely more on relatives for child care than do high-wage mothers (Hofferth 1995).

Stability and flexibility of arrangements. Finally, we found some evidence that moderate- and high-wage mothers whose child care arrangement ends are more likely to leave work than those whose nonparental arrangement does not end. For low-wage mothers it is not whether or not an arrangement ends; rather, it is whether or not the mother either has or is able to obtain another arrangement. Having multiple arrangements appears to be one strategy that provides for a backup in the case an arrangement breaks down. While it fits our common sense understanding, previous research has not had the appropriate data to show the connection.

Returning to the issue that motivated our paper, the contribution of women's traditional role in caring for children to employment turnover, we found evidence that disruptions due to child care instability and to problems locating and paying for nonparental care contribute to the failure of mothers to accumulate the continuous work history that is associated with better pay and benefits. What we were able to find, which was unexpected but perhaps not surprising, is that moderate-wage mothers are the ones most affected by the cost and instability of arrangements, more so than low income mothers, in particular. Low-wage mother have different options – they depend more upon low-cost relative care and father care, or receive child care subsidies. High-wage mothers can afford high-priced care.

The policy implications are clear. First, the availability, cost, and stability of nonparental child care are associated with the stability of maternal employment and explain much of the effect of children on accumulation of work experience, a key aspect of the gender gap in earnings. Public or private efforts to employ mothers need to take their responsibilities for care of children into account if the gap is to continue to narrow. Possible options range from direct provision of child care at the work site and flexible work schedules to increased public subsidies (Hofferth 1995, 1996).

Second, the federal government has already had an important impact on the access of low-income parents to child care, but more needs to be done. Federal child care policies that have improved the delivery of services and

subsidies to low income families have probably helped reduce the effect of cost of care on low-wage mothers' employment. Thus, for them we did not find a strong relationship between cost of care and job exits. Because they have the resources they need, high-wage mothers are also less sensitive to the cost of care. Instead, moderate-wage mothers are the most sensitive to variation in the cost of child care. However, low-wage mothers were affected by the *availability* of care. Many do not have a parent or partner to help them manage these needs. Such mothers are now eligible only for time-limited public assistance and subject to work requirements. Without consistent long-term assistance in caring for children, there is little chance that welfare reform will lead to long-term labor force attachment and economic independence. In addition, their children may suffer. Moderate-wage mothers appear to respond quickly to child care problems by leaving the work force, thereby removing their child from potentially harmful situations; low-wage mothers may not have this option.

Third, the stability of care is linked to the job stability of moderate- and high-wage mothers. While the effects of children clearly cut across all socioeconomic status groups, the accumulation of work experience among moderate-wage mothers is most strongly affected by childbearing responsibilities. How to improve the delivery of services to moderate-wage mothers is an important and neglected policy issue. Middle-class mothers who juggle childrearing and jobs do not have the option of staying home for an extended period, particularly when family leave is still largely unpaid.

Finally, we found that the *availability* of child care programs significantly affects all socioeconomic groups. Thus, making child care available represents an important component of public and private employment policy for all mothers.

Notes

1. We focus upon mothers who already have children. Child care does not become salient until the birth of the first child and research has not found child care costs to affect the fertility behavior of employed women (Blau & Robins 1989).
2. While the education/training of the teacher is associated with child development, parents cannot reliably report their child's teacher's education (Hofferth et al. 1994). As a result, it was not used in this research as a quality indicator.
3. Distance is not relevant for the sitter who comes to the child's home.
4. We might also expect family structure-based variation in the effects of child care on employment exits. Early analyses failed to find such interactions, so this line of inquiry was not pursued.
5. The most detail was obtained for the youngest child, as that was expected to have the strongest effect on the value of home versus work time.

6. This was the first administration of a child care history on a national survey. A one-year period was selected to minimize potential reporting error and respondent burden.
7. The respondent's burden is light as she is asked to recall events that occurred only over the previous year. We expect few biases in the responses as few dates were missing or inconsistent.
8. In this paper we assume that fertility is exogenous to child care costs. This is a reasonable assumption; Blau & Robins (1989) found no effect of child care costs on the fertility of employed women, whereas they did find an effect of child care costs on employment.
9. In early models previous work experience was also included; however, this was never statistically significant and was dropped.
10. One of the key assumptions in this paper and most others using event history models is that the ordering of events indicates causality. Thus it is important to reduce the possibility that a mother left care anticipating a job change.
11. We also looked at child care arrangements which ended two months prior to the reference month and found no lagged effect (not shown).
12. The advantage of measures at the area level is that they are relatively exogenous to the child care and fertility choices of the families living in the community. What is available in the community is only endogenous to the extent that families moved to take advantage of services in a particular area or that high maternal labor force participation in an area creates potential pressure for increased supply of child care. While these are possible sources of selectivity, they are not taken into account in the present analysis. The inclusion of area child care expenditures controls for some of this selectivity.
13. A turnover rate of 3 percent per month was estimated by Blau & Robins (1989) for a low-income sample.
14. It was not feasible to include the characteristics of the mother's care and child care stability in the same model because of the collinearity of stability with the type of care. Area and individual child care characteristics are not included in the same model because they are different measures of the same concept.
15. All tests are conducted at the 0.05 significance level using a one-tailed test, since the direction was predicted.
16. Calculated as $((\text{Odds ratio} - 1) \times 100)$. This represents the percent increase (or decrease) in the Adjusted odds of leaving a job associated with the category of interest relative to the comparison category.
17. The odds ratios are calculated as $\exp[-0.013 \times 12] = 0.855$ and $\exp[-0.013 \times 24] = 0.732$. Then the formula from note 16 is applied.
18. Not all pregnant/parenting mothers actually leave the work force. Many simply take leave from their jobs. If a woman has the same job but is on leave, she is not counted as leaving her job.
19. We added the variables one at a time, first adding in whether a child care arrangement ended in a prior month, second adding whether a mother had one or two or more arrangements at the beginning of the month of risk, and, finally, including both variables. The results are similar and, therefore, are not shown.
20. Based upon an equation similar to that used for hourly wages, a predicted wage was obtained for each mother. Many mothers may actually earn less than their potential due to the fact that they have young children; thus, actual earnings may be endogenous. The predicted wage is a better indicator than actual wage for measuring a mother's potential earnings.

21. A second method for defining income used the area per capita income measure for the county, similarly categorizing the areas the mothers lived in, into three approximately equal groups, with the lowest income area defined as less than $12,942 per capita, the moderate group between $12,942 and $15,574 per capita, and the highest group above $15,574 per capita. The results were very similar to those using potential earnings, and, while not presented here, are available from the authors.

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Address for correspondence: Sandra Hofferth, Institute for Social Research, University of Michigan 48106-1248, USA