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Ridder, Geert (1990), "Attrition in Multi-Wave Panel Data." Pp. 45–67 in Panel Data and Labor Market Studies, edited by J. Hartof, G. Ridder, and J. Theeuwes. North Holland: Elsevier Science Publishers B.V.

Weisbrod, B., M. A. Test, and L. I. Stein (1980), "Alternatives to Mental Hospital Treatment II: Economic Benefit-Cost Analysis", *Archives of General Psychiatry* 37: 400–405.

Weisbrod, B. (1981), "Benefit-Cost Analysis of a Controlled Experiment Treating the Mentally Ill." *Journal of Human Resources* 16: 523–548.

Weisbrod, B. "A Guide to Benefit-Cost Analysis, as Seen through a Controlled Experiment in Treating the Mentally Ill." Pp. 5–42 in *Social Policy Evaluation*, edited by A. Rzain, E. Helpman, and E. Sadka. New York: Academic Press.

Weisman, E. (1988), "Managed Care: Delivering Quality and Value." *Quality Review Bulletin* 14(12): 372–374.

AN EVENT ANALYSIS OF FEMALE LABOR SUPPLY

Alice Nakamura and Masao Nakamura

I. INTRODUCTION

Numerous empirical studies of female labor supply have confirmed the existence of the family-related patterns implied by the classic conceptual studies on this topic, including those of Mincer (1962), Mincer and Polachek (1974), Polachek (1981) and Becker (1981). Having children, being married, and higher income husbands are consistently found to be associated with lower employment rates for women, and with fewer hours of work among women who do work. However, little is known, on even a descriptive level, about the *dynamics* behind these observed cross-sectional associations. Exploring these dynamics was not possible with the cross-sectional data used in early micro level studies of female labor supply. Moreover, even though panel data have been available for some time by now, most of the models that have been estimated with panel data are designed to characterize work behavior at points in time—not the dynamic adjustment processes *leading* to the observed behavior at those points in time. This is evident from how the included explanatory variables are defined. For example, most of these models contain a variable for the number of children ever born, or the number of children younger than some age like 18 or 12 or 6. The estimated coefficient of this sort of a "stock"

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child status variable cannot provide insight into *how* women with children come to work less. There is no way of determining, for instance, whether mothers typically reduce their labor supply all at once or gradually over many years, and whether this reduction occurs at, before, or following their first births. Likewise, the estimated coefficients of the usual current period variables for marital status and husband's earnings offer no insight into *when* marriage-associated reductions in labor supply usually take place.

This study provides a descriptive mapping of the dynamic labor supply responses of women to events such as births and marriages. It makes use of samples of created composite records for women, with these composite records spanning three year intervals centered around year t with $t = 1, \ldots, 8$ for the calendar years of 1970–1977. The main objective of this study is to provide a more realistic context for further theoretical modelling of the dynamics of female labor supply, and for further empirical explorations of these dynamics. In addition, these results should be helpful to employers and others who must try to foresee the future labor supply choices of women in making practical choices with outcomes that depend on future labor supply, such as the allocation of employer-provided or subsidized job training.

Our own earlier research (Nakamura and Nakamura, 1985a, 1985b, 1992, 1994) and research findings by Duleep and Sanders (1994) document the importance of taking account of work behavior in the previous time period for predicting subsequent work behavior and for understanding the labor supply responses of women to changes in child status. These earlier findings are supported and extended by the findings of this study.

Section II provides an overview of earlier related research of others. Section III describes our data samples and the equations estimated in this study for the probability of work and for hours of work. Section IV presents our empirical results for the child status variables included in the estimated equations. Empirical results for the included marital status variables are given in Section V, and results for unemployment and earnings variables for the husbands of married women are presented in Section VI. Numerical examples are provided in Section VII. Section VIII concludes.

II. EARLIER STUDIES

This study builds on earlier studies that each explore the dynamic labor supply responses of women to single events such as a birth, or marriage, or divorce.

A. Labor Supply Responses to Births

Mott and Shapiro have published a large body of research examining the employment and earnings of women who were included in the National Longitudinal Surveys (NLS) of Young Women and who had a first birth between the 1968 and 1973 surveys. They summarize the key findings from their earlier papers:

> In earlier work (Mott and Shapiro 1978; Shapiro and Mott 1978, 1979), we examined the labor supply behavior of prospective and new mothers. . . . Our analyses, focusing on those NLS respondents who gave birth to a first child during the initial five years of interviewing led us to conclude . . . that large numbers of young women were choosing to retain close ties to the labor market in the months just before and also just after the onset of childbearing. . . . Subsequent research (Mott and Shapiro 1982, 1983) followed up on these women to 1978, five to ten years after the first birth. This follow-up work demonstrated that employment in the months surrounding the first birth was indeed an excellent indicator of subsequent work activity during these years of childbearing and raising of young children. This relationship was evident even after controlling for subsequent fertility, schooling, husband's income, and other determinants of women's labor supply (Shapiro and Mott, 1994, pp. 249–250).

In a 1994 paper, Shapiro and Mott continue to follow the employment and earnings experiences of the same women examined in their earlier studies. They find that

> . . . employment activity in the period immediately surrounding the first birth is a significant independent predictor of lifetime work experience. Differences in work behavior according to first-birth employment are still evident 14–17 years after the first birth, particularly for women who returned to work within six months following the birth. The corresponding differences in lifetime work experience result in higher wages (Shapiro and Mott, 1994, p. 248).

In the studies mentioned above, Shapiro and Mott group women according to their work behavior in the six months before and the six months after their first births, and then examine the subsequent annual employment and earnings experiences of the women in these groups. In contrast, Even (1987), O'Connell (1990), Leibowitz, Klerman and Waite (1991), Klerman (1993), and Klerman and Leibowitz (1993, 1994) examine *monthly* employment and work behavior immediately before and after the birth of a child. Summing up one main result of their research, Klerman and Leibowitz (1994, p. 296) report that "more than three quarters of women working full-time before the birth of the child return to work within six months of delivery." (Klerman and Leibowitz also note that many of the women who are employed when their children are born are not at work then. They are on paid or unpaid leaves.)

An alternative to grouping women by their work behavior in the months before and after a birth is to group them by work behavior in the previous year ($t - 1$) and then examine the current year (t) labor supply responses of the women in these groups to various child status variables. This is what Nakamura and Nakamura (1985a, 1985b, 1992, 1994) and Duleep and Sanders (1994) do. They find that the estimated child status responses are quite different for women who did versus women who did not work in $t - 1$. Furthermore, Duleep and Sanders find that these observed patterns of child status responses for women who did versus did not work in the previous year are remarkably stable even across different groups of recent immigrants to the United States. Duleep and Sanders explain:

> Census data allow us to examine reference week employment rates conditional on employment status in the previous calendar year (work in $t - 1$; no work in $t - 1$). Table 2 shows these

conditional employment rates for the native born, Asian immigrant, Hispanic immigrant, and European immigrant women classified by the number of children and the age of the youngest child. . . . In Table 2, instead of large differences by immigrant status, there are large differences by work status in the previous year. The rates for women with no children are in the relatively narrow ranges of .75 to .88 for those who worked in $t - 1$ and from .07 to .17 for those who did not work in the previous year. . . . Similarly, the employment rates for the women with a youngest child ages 6–11 or 12+ range from .74 to .92 for those who worked the previous year, and from .03 to .13 for those who did not work the year before. It is only for the women with a youngest child age one or younger and who worked in the previous year that large differences persist among the groups (Duleep and Sanders, 1994, p. 333).

In addition, Duleep and Sanders note:

Another striking feature is how distinctly different the relationship between the propensity to work and age of the youngest child is for women who worked in the preceding year as compared with women who did not work the preceding year. For the latter group, the relationship between age of the youngest child and the probability of working is quite flat. For women who worked the preceding year, the relationship is dramatically different; for all groups, there is a "baby effect" and then smaller differences by age of youngest child among women with children above two years of age (Duleep and Sanders, 1994, pp. 335–336).

B. The Effects of Marriage

Birth is the key discretionary event governing the number of young children in a family. However, marriage is the initial act of family formation for most families. There have been few studies of the impacts of the event (as opposed to the ongoing state) of marriage on women's work behavior. In fact, most studies of female labor supply are limited to married women, or even to women continuously married over several years. An exception is Kathryn Shaw's 1994 study of the impact of marriage on female labor supply, which is part of a larger study examining the extent and nature of changes in the *persistence* of female labor supply behavior. Shaw explains the reasons for, and meaning of, her focus on persistence:

Previous empirical research has revealed that persistence is an important characteristic of married female labor supply behavior. Goldin (1990) found that even as early as 1930 the average years of work experience for a working married woman age 30–39 was a high 10.2, though only about 12 percent of all married women worked then. . . .

However, no one has examined whether the increased participation rates of married women over time have been accompanied by *changes* in the persistence of female labor supply. . . . Increasing persistence means that those who have not been working are less likely to begin to work, and those who have been working are increasingly likely to continue to work. The observed increases over time in female employment rates could have been accompanied by either decreasing or increasing persistence of married female labor supply (Shaw, 1994, pp. 348–349).

Using data from the Michigan Panel Study of Income Dynamics (PSID), Shaw finds that there has been little change over the last 20 years in the persistence of the

labor supply behavior of married women. As she explains, this is despite substantial increases over this period in the labor supply of married women:

Over the last 20 years, the participation rates of married women have increased at a pronounced rate. . . . Despite these rising participation rates, and similar increases in hours, we find that the overall persistence of employment ... has not changed over time. . . . in 1968–70, 83.2 percent of all women did not change their work status over two years (39.7 percent remained employed plus 43.5 percent remained nonworkers), and in 1985–87, 88.4 percent did not change their work status (some 68.0 percent remained employed plus 20.4 remained nonworkers). . . . A longer work history shows a similar pattern of fairly constant persistence over time. . . . The reason persistence hasn't changed over time is that as the number of women who are persistent nonworkers has decreased, they have been replaced by somewhat greater increases in the number of persistent workers (Shaw, 1994, pp. 360–362 and p. 367).

However, Shaw does find evidence of increasing persistence for single women. She also finds evidence of an increasing tendency for pre-marriage employment patterns to carry over into the married years. Shaw writes:

Table A5 contains regression results for the probability of participation and the hours of work for single women. . . . The striking feature of this table is that both hours of work and the employment rates became much more persistent over time with the greatest increases among young women. . . .

The important followup question is, do the changing patterns of work for single women persist into the married years? To address this, single women were followed into their married years if they married during the PSID survey years. . . . The results show that in the early 1970s the patterns of labor supply developed prior to marriage did not persist into the married years, but by the 1980s, the pre-marriage patterns do persist (Shaw, 1994, pp. 366–367).

C. Labor Supply Effects of Divorce

Divorce is the other main event affecting family structure. Johnson and Skinner used PSID data to study the effects of divorce on female labor supply. They explain the design of their event study:

To estimate the model, we used a cross-section sample of married families from the PSID. We chose 1972 for the sample year because it provided information on past work history in 1968–69 and information on future separations (between 1973 and 1978), and because a number of psychological questions which may be important in explaining divorce were asked by the survey in that year. The sample combined two groups, all of whom had been married at least four years: 1599 couples who remained married during the entire panel period without any disruption in family structure, and 187 couples married in 1972 but who separated between 1973 and 1978 (Johnson and Skinner, 1986, p. 459).

Their main result is that divorce tends to substantially increase female labor supply:

Panel data allow us to control for unobserved heterogeneity by measuring the labor supply of the same person in the years preceding and following the marital separation. A comparison of

> average hours worked before and after the couples split indicates that actual separation marginally reduced work effort of men, but led to a substantial rise in female work hours (Johnson and Skinner, 1986, p. 455).

In particular, Johnson and Skinner find that there are positive effects of divorce on the labor supply of women with relatively little previous work experience:

> Including work experience and children should provide a stronger test of our hypothesis since the probability of divorce would be likely to have affected past work and fertility behavior as well as current labor supply. . . . The coefficients on actual divorce are positive and are significant at the 0.01 level, while the interaction between past labor force participation and divorce is significantly negative and of a similar magnitude. These coefficients taken together imply that divorce affects labor supply for women with weak past work experience (Johnson and Skinner, 1986, p. 463).

III. OUR DATA SAMPLES AND LABOR SUPPLY EQUATIONS

The data used in this study are from the 1969–1979 waves of the PSID. Only the data for the women who were included in all of those waves of the PSID and who were 21–46 years of age were used in this study. For each woman for each year t from 1970–1977, we constructed a composite record consisting of the personal and work related characteristics of the woman as of the time of the PSID interview in that year t, as well as certain characteristics of the woman for the years $t - 1$ and $t + 1$. If a woman was married over the whole period of $t - 1$ through $t + 1$, the husband variables are set equal to the values for the unemployment and earnings experiences of her husband over this period; otherwise these variables are set equal to zero. (The income and unemployment information for a given calendar year are taken from the following year's wave of the PSID.)

The constructed composite data records for individual women for the years of $t = 1, \ldots, 8$ were used to form four estimation data samples. The first consists of all the pooled composite records for women who did not work in year $t - 1$. The second sample is a subgroup of the first one consisting of all the records for the women who did not work in $t - 1$ but who did work in year t. The third sample includes all the composite records for the women who worked in $t - 1$, and the fourth one is made up of all the composite records for the subgroup of women who worked in $t - 1$ and also in t.

Mean values for the explanatory variables of interest were computed for all four of our data samples. Also, probit equations for the probability of work in year t were estimated for data samples 1 and 3 with the dummy dependent variable set equal to 1 for women who worked in year t. The probit equation that was estimated using sample 1, with all the composite records for women who did not work in $t - 1$, is an equation for the probability that a woman who has not been working will start to work. For sample 3, which is all the composite records for women who worked in $t - 1$, the probit equation that was estimated is an equation for the probability that a woman who was working *will continue to work.*

In addition to the probit equations for the probability of work, equations for the annual hours of work in year t for women who worked in t were estimated using data samples 2 and 4. The first of these is for the expected hours of work in year t of a woman who started working in year t after not working for at least the previous year. Of course, some women in this situation will have begun to work part way through year t. This alone would tend to make the average hours of work for the year lower for a sample 2 woman compared with a sample 4 woman who also worked in the previous year. The second of the hours equations, for sample 4, is for the expected hours of work in year t of a continuing worker: a woman who worked in $t - 1$ as well as t.

In the rest of the paper, the mean values and the probit and hours equation coefficient estimates are examined for specific groups of the explanatory variables included in our probit and hours equations: first the child status variables (Section IV), then the marital status variables (Section V), and then the variables for the unemployment and the earnings of the husbands of the married women (Section VI). In addition to the explanatory variables for which estimated coefficients are shown in the tables in the text, the probit and hours of work equations for the women who worked in $t - 1$ include an hourly wage variable for $t - 1$ (measured in constant 1967 dollars) and an annual hours of work variable for $t - 1$. Also, all of the estimated equations include an education variable; an age variable; and dummy variables for black women, for those who received Aid to Families of Dependent Children (AEDC) in $t - 1$, and for those who received Social Security assistance in $t - 1$. The coefficient estimates discussed in the following sections are the estimated impacts of the stated events after controlling for these other included explanatory variables.

We have not included a selection bias term in the hours equations for which results are shown in the text. As a consequence, the estimated hours equation coefficients in this study could be capturing effects of the selection of the women who worked that are correlated with some of the included explanatory variables, as well as direct impacts on women's annual hours of work of those explanatory variables. In this study, we are trying to determine whether there are overall effects of any sort for the event variables of interest, after controlling for background factors that are observed for $t - 1$ such as work in that year and for period t characteristics that could also be determined for most adult women from period $t - 1$ information that would be observable for forecasting and decision making purposes such as years of formal schooling, age and race. (For further discussion of conditional equations of this sort see Nakamura and Nakamura, 1985a, 1985b, 1992, 1994.)

IV. CHILD STATUS VARIABLES

Do women tend to reduce their labor supply in response to the births of their children, or do women who have children work less even before they begin having

children? Does most of any child-related adjustment in labor supply take place at the time of the birth of the first child, or are there also substantial adjustments when second and higher order babies are born? After allowing for birth-related adjustments in labor supply, are there further and ongoing adjustments to the presence of children 2 to 5, or to the total number of children younger than 18? These are the questions addressed in this section.

Seven birth dummies are defined: one for no birth over the three year period of $t-1$ through $t+1$ (the birth dummy omitted from our probit and hours equations); dummy variables for a first birth in $t-1$, for a first birth in t, and for a first birth in $t+1$; and dummy variables for a birth of parity two or higher in $t-1$, in t, and in $t+1$. In addition we define a young child dummy set equal to 1 if a woman had a youngest child aged 2–5 in year t. (A child who is 2–5 in year t was born in $t-2$ or before, and hence is not accounted for by our dummies for births.) Our last child status variable is a continuous variable for the number of children in the home who are younger than 18.

A. Mean Values

Table 1 shows mean values for the child status variables for our four data samples. The numbers in column 1 are for the sample 1 women who did not work in year $t-1$. Some of the women who did not work in $t-1$ did work in year t. Mean values for these sample 2 women are in column 2. Column 3 shows mean values for the sample 3 women who did work in $t-1$. Among those who worked in $t-1$, some also worked in year t. Their mean values are computed using sample 4 and are shown in column 4.

The mean value for a dummy variable is simply the sample proportion of cases for which the condition when the dummy variable is set equal to 1 is true. The mean values in row 1 of Table 1 are for the dummy variable set equal to 1 for the cases for women who had no birth over the period of $t-1$ through $t+1$. From those mean values we see that a higher proportion of the women who did, versus the women who did not, work in $t-1$ had no birth in $t-1$ through $t+1$ (.860 from column 3 versus .792 from column 1).

The mean values for most of the other child status variables display corresponding patterns. In particular, the women who worked in $t-1$ tend to have less children younger than 18 and are less likely to have a parity 2+ baby or a preschool child 2–5 years of age than those who did not work in $t-1$. Those who worked in t as well as in $t-1$ tend to have lower mean values for these child status variables than is the case for all those who worked in $t-1$. Likewise, those who worked in t though not in $t-1$ tend to have lower mean values for these variables than all those who did not work in $t-1$. It is only for the coefficient estimates for the dummy variables for a first birth that there are no obvious consistent patterns.

Table 1. Mean Values for Child Status Variables: U.S. Women 21–46

	Did not Work in t – 1		*Worked in t – 1*	
	All	*Worked in t*	*All*	*Worked in t*
Dummy for no birth in $t-1$, t or $t+1$ (omitted category)[a]	.792	.786	.860	.886
Dummies for first birth:				
In $t-1$	.021	.024	.013	.013
In t	.010	.024	.015	.008
In $t+1$	.004	.004	.015	.012
Dummies for other birth:				
In $t-1$	.066	.059	.035	.029
In t	.059	.051	.029	.025
In $t+1$	.048	.032	.033	.027
Dummy for a youngest child age 2–5 in t	.34	.29	.18	.17
Number of children younger than 18 in t	2.6	2.5	1.8	1.7

Note: See Section III for a description of the data samples.

[a] This variable was omitted from all of our estimated equations.

B. Coefficient Estimates for the Child Status Variables

Table 2 shows coefficient estimates for the child status variables from our estimated equations for the probability of work in t (columns 1 and 2 in Table 2 based on samples 1 and 3), and for the hours of work in the year for those who did work in t (columns 3 and 4 based on samples 2 and 4).

According to the Table 2 results, the probability of continuing to work in the current year t for women who worked in $t-1$ is greatly reduced by the birth of a first child in t, or the birth of a first child in $t+1$. A woman observed to quit work in the year of, or in the year before, her first child was born may have had long term plans to do this or she may have developed unexpected problems with her pregnancy that led her to quit work. And those who quit work in the year of the birth of a first child may have had a baby (or babies) requiring extra care, or have found caring for a newborn baby and working to be more difficult than expected. The estimated effects are large enough that it would be interesting to know more about the causal reasons. This is a promising area for further research.

In contrast to the large and statistically significant negative impacts of a first birth for women who worked in $t-1$, the corresponding estimated impacts for women who did *not* work in $t-1$ are insignificantly different from zero. In other words, a first birth is found to be associated with lower probabilities for continuing, but not for starting, work.

Table 2. Probit and OLS Coefficient Estimates for the Child Status Variables in Equations for the Probability of Work and for Hours of Work in Year *t*: U.S. Women 21–46

	Probits for Probability of Work		*Hours Equation*	
	Did not Work in t – 1	*Worked in t – 1*	*Did not Work in t – 1*	*Worked in t – 1*
Dummies for first birth:				
In $t-1$	–.10	–.26	186	106
In t	.29	–1.74[a]	–488[a]	–81
In $t+1$	–.19	–1.30[a]	–602[a]	–394[a]
Dummies for other birth:				
In $t-1$	–.38[a]	–.25	–16	56
In t	–.11	–.13	–124	–126[a]
In $t+1$	–.20	–.41[a]	–217[a]	–356[a]
Dummy for youngest child age 2–5 in t	–.29[a]	–.25[a]	4	16
Number of children younger than 18 in t	.05[a]	–.10[a]	–32	–13

Note: Taken from Table A1 in the Appendix.

[a]Significantly different from zero with at least an 80 percent confidence level. The hours equation standard errors were corrected for heteroscedasticity with the ROBUSTSE option of the TSP package.

For a second or higher order birth, two of the three estimated coefficients are insignificantly different from zero for the women who did and also for the women who did not work in $t-1$, though all are negative. If there is a negative effect of a second or higher order birth on the probability of work, our estimates suggest the effect is weak in contrast to the strong negative impacts of a first birth for the women who worked in $t-1$.

In addition to the impacts of a birth on the probability a woman will work, from columns 3 and 4 it can be seen that there are also estimated negative impacts of a birth in t or in $t+1$ on the hours of work in t of those working then.

The estimated impacts for the birth dummy variables can be compared with the results in the bottom two rows of Table 2 for two more conventional child status variables: a dummy variable for the presence of a preschool child 2–5 years of age, and a continuous variable for the number of children in the family younger than 18. These results suggest that having a youngest child 2–5 reduces the probability that a woman will work, whether or not she worked in $t-1$. Having more children younger than 18 is estimated to reduce the probability of work for women who worked in the previous year, but to raise it for those who did not work in $t-1$. However, these estimated effects are small in magnitude compared to the strong

negative impacts of having a first child in year t or $t+1$ on the probability of continuing to work in year t for women who worked in $t-1$.

The Table 2 results suggest that it is important to include birth dummy variables for first births, and perhaps also for higher order births, in addition to the usual variables for the presence of preschool children and the total number of children younger than 18. More particularly, the results suggest that it is inappropriate to use child status variables that fail to differentiate new babies from other preschoolers, and first babies from second and later ones. Also, our results imply that it is inappropriate to constrain the child-related labor supply responses of women to be the same for the women who worked in the previous year versus those who did not.

V. MARITAL STATUS VARIABLES

Married women have lower employment rates than single or divorced women. Does this mean that women tend to reduce their labor supply when they get married, or simply that women who marry tend also to be women who work less? If there is a marriage-related negative effect on the probability of work, is there also an anticipation effect of the sort for which we found preliminary evidence for the births of first children to women who worked in $t-1$? Are there adjustment responses that result in further reductions in labor supply in the year following marriage? Are there also divorce effects on the probability of work for women, and on their hours of work when they do work? These are some of the questions we would like to be able to answer about marital status effects on female labor supply.

To explore these questions, dummy variables were defined that allow us to distinguish whether a woman was single and never married (S), married or in a long-term live-in relationship (M), or separated or divorced (D) in each of the years $t-1$, t and $t+1$. For example, M,M,M is a dummy variable with a period t value of 1 for a woman who was married in years $t-1$, t and $t+1$. Similarly, S,M,D is a dummy variable with a period t value of 1 for a woman who was single in year $t-1$, married in year t, and divorced in year $t+1$.

A. Sample Proportions

Table 3 shows the sample means for our marital status dummy variables, which are the sample proportions in the various marital status categories.

Looking across row 1, the proportion of women married in all three years falls from .715 for all those who did not work in $t-1$, to .652 for the subgroup of those who did not work in $t-1$ but did work in t, to .573 for all those who worked in $t-1$, to .561 for the subgroup of those who worked in $t-1$ who also worked in t. Looking across row 2 for the same four groups of women, the proportion who were single in $t-1$ through $t+1$ rises from .121 to .146 to .157 to .163. Similarly, looking across row 3, the proportion of women who were divorced in $t-1$ through $t+1$ rises from .131 to .138 to .186 to .189. Thus, we find, as might be expected, that

Table 3. Mean Values for Marital Status Variables: U.S. Women 21–46

	Did Not Work in t – 1		Worked in t – 1	
	All	Worked in t	All	Worked in t
M,M,M (omitted category)[a]	.715	.652	.573	.561
S,S,S	.121	.146	.157	.163
D,D,D	.131	.138	.186	.189
S,S,M	.003	.010	.008	.008
S,M,M	.009	.012	.016	.015
S,M,D	0.0[b]	0.0[b]	.001	.001
M,M,D	.008	.024	.008	.009
M,D,D	.004	.012	.012	.013
M,D,M	.004	.006	.008	.008
D,D,M	.002	0.0[b]	.013	.015
D,M,M	.002	0.0[b]	.016	.015
D,M,D	.001	0.0[b]	.002	.003

Notes: See Section III for a description of the data samples.
[a]This variable was omitted from all of our estimated equations.
[b]The corresponding variable was omitted from the estimated equation for this column.

there is a negative association for women between working and being married, and positive relationships between working and being single or divorced.

Adding the top three figures of column 1 for all women who did not work in $t-1$ (that is, adding the figures for the sample 1 women who throughout $t-1$ through $t+1$ were always married, or always single, or always divorced) yields .967. This is the proportion of cases for the sample 1 women with no change in marital status over the period of $t-1$ through $t+1$. Similarly, .936 is the proportion of cases for the women who did not work in $t-1$ but did work in year t who had no change in marital status from $t-1$ through $t+1$. The corresponding figure for all women who worked in $t-1$ is .916, and for the women who worked in $t-1$ and also in t is .913. From this, we know that the proportion who *did* change marital status rises moving from the first to the fourth of our data samples. However, even for sample 4, only .087 (= 1 – .913) of the cases are for women who had a change in marital status over the three year period of $t-1$ through $t+1$. At the other extreme, for the women who did not work in $t-1$ (column 1), only .033 changed marital status. One consequence of this is that for some marital status groups there are very few, or sometimes no, cases in some of our data samples for which the corresponding dummy variables equal 1. When there are no cases in which a dummy variable equals 1, the mean value for that dummy variable is 0.0. For example, for women who did not work in $t-1$, there are no observations for women who were single in

$t-1$, married in t, and divorced in $t+1$. Likewise the sample 1 and the sample 2 mean values for the dummy variable S,M,D are 0.0. The dummy variables for which there are no nonzero observations for some of our samples must, of course, be omitted from the equations estimated for those samples.

B. Coefficient Estimates for the Marital Status Variables

Coefficient estimates for the marital status dummy variables are given in Table 4, which is laid out in the same way the child status coefficient estimates are in Table 2.

Only a few of the coefficients of the marital status dummies are significantly different from zero, with even an 80 percent level of confidence. This is not what we had expected given the theoretical arguments stressing the presumed negative impacts of marriage on female labor supply, and the commonly observed differences in participation and employment rates for women who are single versus married versus divorced. One possible explanation is that it is specific aspects of being married—aspects that are largely controlled for in our probit and hours equations, such as newborn children — and the inherent persistence of labor supply behavior in the absence of important changes in circumstances that are mostly responsible for the observed differences in employment rates by marital status.

Table 4. Probit and OLS Cofficient Estimates for the Marital Satus Variables in Equations for the Probability of Work and for Hours of Work in Year *t*: U.S. Women 21–46

	Probits for Probability of Work		Hours Equation	
	Did not work in t – 1	Worked in t – 1	Did not work in t – 1	Worked in t – 1
S,S,S	–.06	–.04	12	–27
D,D,D	–.06	–.31[a]	–135	–4
S,S,M	.49[a]	2.13	185	27
S,M,M	.11	–.22	874[a]	69
S,M,D	—	–.47	—	–520[a]
M,M,D	1.28[a]	.67	-33	172
M,D,D	1.09[a]	.35	906[a]	69
M,D,M	.47	1.50	606[a]	–41
D,D,M	–2.72	.48	—	–45
D,M,M	–1.66	–.40	—	–153[a]
D,M,D	–2.29	1.04	—	–18

Note: Taken from Table A1 in the Appendix.
[a]Significantly different from zero with at least an 80 percent confidence level. The hours equation standard errors were corrected for heteroscedasticity with the ROBUSTSE option of the TSP package.

The coefficient estimates that *are* significantly different from zero are the large positive ones for the women who did not work in $t-1$ for the dummy variables for the two categories involving transitions from married to divorced without a switch back to married over the three year observation interval. These are the categories denoted by the dummy variables M,M,D and M,D,D. The coefficient estimates for these dummy variables suggest that, for women who had been married and not working, a separation or divorce in year t, or even the anticipation of a separation or divorce in $t+1$, was associated with a substantial increase in the probability of working in year t.

VI. HUSBAND'S UNEMPLOYMENT AND INCOME VARIABLES

In line with the standard practice of controlling for the earnings of husbands in specifying models of the labor supply of married women, we have defined a variable set equal to the period t earnings of the husband for the cases for women who had a husband in years $t-1$ through $t+1$, and set equal to zero otherwise. We have also defined a variable set equal to the change in the husband's earnings from $t-1$ to t for women who had a husband in years $t-1$ through $t+1$, and set equal to zero for all other cases. In addition, we have dummy variables for the various possible sequences for the husband's years of unemployment (U) and years of work with no unemployment (W), with these variables automatically set equal to zero for women not married in all years over the period of $t-1$ through $t+1$. For example, the variable U,W,W is set equal to 1 for period t cases for women married in $t-1$ through $t+1$ to husbands who had a spell of unemployment lasting at least one week in year $t-1$, but who worked and had no weeks of unemployment in years t and $t+1$. When all of the included marital status dummies equal zero, then one of the dummy variables for the unemployment status for the husband must equal 1 unless the woman was married in $t-1$ through $t+1$ to a husband who worked and did not have any spells of unemployment over the three year observation period. (Observations for married women whose husbands were not in the labor force in one or more years over the period of $t-1$ through $t+1$ were not included in our data samples.)

A. Mean Values

The mean values for the unemployment dummy variables are the sample proportions of the cases for which these dummy variables equal 1. It can be seen that there are no women for which W,U,U equals 1 for those who did not work in $t-1$.

Because of how the dummy variables are defined, the mean values in the columns in Table 5 for the unemployment dummies sum to the respective mean values shown in row 1 of Table 3 for the marital status dummy variable M,M,M. The sample mean values for M,M,M are .715 for all women who did not work in $t-1$ (sample 1),

Table 5. Mean Values for Husband's Unemployment and Income Variables: U.S. Women 21–46

	Did not Work in t – 1		*Worked in t – 1*	
	All	*Worked in t*	*All*	*Worked in t*
Dummies for unemployment of husband in $t-1$, t, $t+1$				
W,W,W (omitted category)[a]	.299	.257	.225	.220
U,W,W	.118	.091	.095	.095
W,U,W	.012	.055	.017	.019
W,W,U	.010	.028	.019	.021
U,U,W	.138	.118	.089	.090
U,W,U	.004	.004	.012	.011
W,U,U	0.0[b]	0.0[b]	.006	.007
U,U,U	.133	.099	.108	.098
Husband's income in t (1000s of 1967$)	7.47	6.15	5.22	5.00
Change in husband's income from $t-1$ to t (1000s of 1967$)	.11	–.16	.21	.14

Note: See Section III for a description of the data samples.
[a]This variable was omitted from all of our estimated equations.
[b]The corresponding variable was omitted from the estimated equation for this column.

.652 for the women who did not work in $t-1$ but did work in year t (sample 2), .573 for all the women who did work in $t-1$ (sample 3), and .561 for the women who worked in $t-1$ and also in year t (sample 4). These are the proportions of cases in our data samples for women who were married in $t-1$ through $t+1$. Thus, one main reason why the mean values for W,W,W get smaller moving from left to right across the first row of Table 5 is that the proportion married gets smaller moving from sample 1 across the row to sample 4, since the unemployment status dummies (including W,W,W) are zero for women not married over the whole period of $t-1$ through $t+1$. All of the mean values in Table 5 reflect the effects of the percentages of women who were married as well as the unemployment and earnings experiences of the husbands of the women who were married.

The proportions of observations in our samples for married women with husbands who worked in all three years (that is, the proportions for which W,W,W equals 1) range from .299 for sample 1 to .220 for sample 4. The next highest proportions are for married women whose husbands had weeks of unemployment in all three years (so that U,U,U equals 1). These range from .133 for sample 1 to .098 for sample 4. Thus, among women married in $t-1$ through $t+1$, a little more than twice as many had husbands who worked and had no unemployment in $t-1$ through $t+1$ as had husbands who were unemployed in all three of these years.

The next to last row of Table 5 shows mean values for the husband's income variable. This variable also equals zero for women not married in $t-1$ through $t+1$. In moving from sample 1 to sample 4, it can be seen that the women whose observations make up these samples could rely on progressively less income from a husband. This, of course, is partly because progressively fewer *had husbands* for $t-1$ through $t+1$ in moving from sample 1 through to sample 4.

B. Coefficient Estimates for the Husband's Unemployment and Income Variables

Table 6 shows the estimated coefficients for the dummy variables for the work and unemployment experiences of the husbands, and for the incomes of the husbands in year t and the changes in the incomes of the husbands from $t-1$ to t. Again the layout is the same as for Table 2.

Most of the probit coefficient estimates for the unemployment dummy variables are quite close to zero in magnitude. The main exceptions are the statistically significant and large positive coefficients for the dummy variables W,U,W and W,U,U in rows 2 and 6. It seems that if a husband worked and had *no* unemployment in year $t-1$ and then had some unemployment in year t, his wife was considerably

Table 6. Probit and OLS Coefficient Estimates for the Husband's Unemployment and Income Variables in Equations for the Probability of Work and for Hours of Work in Year t: U.S. Women 21–46

	Probits for Probability of Work		*Hours Equation*	
	Did not Work in t – 1	*Worked in t – 1*	*Did not Work in t – 1*	*Worked in t – 1*
Dummies for unemployment of husband in $t-1$, t, $t+1$				
U,W,W	–.07	.35[a]	–79	–62
W,U,W	2.59[a]	3.10[a]	–226[a]	–275[a]
W,W,U	1.00[a]	.91[a]	148	–139
U,U,W	–.00	.22	–190[a]	–15
U,W,U	–.09	–.29	98	125
W,U,U	—	2.42[a]	—	–251[a]
U,U,U	–.05	–.09	29	–54
Husband's income in t (1000s of 1967$)	–.03[a]	–.03[a]	–19[a]	–14[a]
Change in husband's income from $t-1$ to t (1000s of 1967$)	–.00	–.02	–17[a]	2

Note: Taken from Table A1 in the Appendix.
[a]Significantly different from zero with at least an 80 percent confidence level. The hours equation standard errors were corrected for heteroscedasticity with the ROBUSTSE option of the TSP package.

more likely to start or to continue to work in year t than a wife whose husband had no unemployment in year t as well as year $t-1$, or a wife whose husband was unemployed in $t-1$ as well as year t. That is, both the starting and the continuing probabilities of work in year t are substantially higher for wives with husbands who were working with no unemployment in $t-1$ and then suffered bouts of unemployment in year t. However, this increased likelihood of work is associated with annual hours of work that are significantly lower, by an estimated 226 to 275 hours. This pattern would be consistent with wives starting or continuing to work out of economic necessity, rather than for career reasons, or with wives living in localities where work is harder to find (which could also be a cause of the unemployment of the husband).

The only other significant and relatively large probit coefficients for the husband's unemployment dummy variables are for W,W,U. The coefficient estimates for W,W,U are 1.00 and .91 for the wives who did not and who did work in $t-1$, respectively, compared with 2.59 and 3.10 for the dummy variable W,U,W for the wives who did not and did work in $t-1$, respectively; and 2.42 for the coefficient estimate of W,U,U for the wives who worked in $t-1$. The estimated coefficients for W,W,U suggest a positive anticipation effect on the labor supply of wives of husbands who were working and had no unemployment in $t-1$ and t but became unemployed in $t+1$. The smaller estimated probit coefficients for W,W,U compared with those for W,U,W and for W,U,U suggest that the anticipation of the husband's unemployment in $t+1$ had a lesser impact on the probability of work for a wife in year t than an episode of unemployment for the husband in year t, as would be expected. The hours equation coefficients for W,W,U are insignificantly different from zero, in contrast to the significantly negative hours equation coefficients for W,U,W and W,U,U.

After controlling for the unemployment of the husband, there is still a significant negative relationship between the earnings of the husband and both the probability of work and the annual hours of work for the wife. However, the husband's earnings in year t would have to be lower by $80,000 or more (in 1967 dollars) to have roughly the same estimated impact on a wife's probability of work in year t as a bout of unemployment in year t for her husband if he worked and had no unemployment in year $t-1$. Also, the estimated coefficients for a change in the husband's income from $t-1$ to t are even smaller in magnitude and mostly insignificant.

VII. NUMERICAL EXAMPLES

Some numerical examples may help convey a sense of the relative importance of the estimated effects discussed in the previous sections, and how these might be expected to alter a woman's work behavior over some number of years. For these hypothetical examples we use a four year simulation time interval, including one year prior to and two years following the year of occurrence for each specified event.

As the baseline case for *continuing work behavior* (the work behavior in year t of those who worked in $t-1$) we specify a hypothetical woman who worked in $t-2$ and who has a probability of continuing to work in each year (given work in the previous year) of .95, who is expected to work 2,200 hours each year that she does continue to work, and who has an exogenously set hourly wage rate of $4 (measured in constant 1967 dollars). This baseline woman is specified to have no young children and to be continuously married to a man with no unemployment over the simulation time interval and an annual income of $6,000 (measured again in constant 1967 dollars). The specified baseline probability of work, and hours of work and earnings if the woman works, are shown in the top panel of Table 7 for years $t-1$ through $t+2$. The figures in the remaining panels of Table 7 are computed as deviations from the baseline case using the estimated coefficients of the probit and hours of work equations discussed in the previous sections. That is, in the remaining panels of Table 7 we show the predicted continuing work behavior for women identical in all respects to the baseline woman except for the occurrences of the specified events.

Comparing the figures in panel 2 of Table 7 with those in panel 1, we see that the birth of a first baby in year t is predicted to be associated with dramatic drops in the probabilities of continuing to work in year $t-1$ and particularly in year t, followed by a return to quite high probabilities of continuing to work in $t+1$ for women who work in year t, and of continuing to work in $t+2$ for women who work in $t+1$. Comparing the figures in panels 2 and 3 of Table 4, we see that the negative impacts of a birth in year t on the probability of work are predicted to be substantially larger in years $t-1$ and t for a first birth than for a higher parity birth, but are similar for years $t+1$ and $t+2$. The associated effects of either a first or a higher parity baby on a woman's hours of work if she does work are in the same direction versus the baseline case (always down) and follow similar patterns over the years of $t-1$ through $t+2$.

The figures shown in panel 4 of Table 7 are for a woman who was divorced in $t-2$ and $t-1$, rather than married like the baseline woman, and who then got married in year t to a husband with an income of $6,000. Comparing the figures in panel 4 with those in panel 1, we see that remarriage is predicted to be associated with a slightly higher probability of work in the year prior to the remarriage and then with somewhat lower probabilities of work in the year of the remarriage and in the two years following that. The predicted hours of work for this woman if she works are somewhat lower in all four years than in the baseline case.

Panel 5 shows the predicted work behavior of a wife similar in all respects to the baseline wife except that the earnings of the husband are $6,000 lower in t than in $t-1$, and then return to the $t-1$ level in $t+1$ and $t+2$. (The drop in the husband's income is specified as *not* due to unemployment.) Comparing the figures in panel 5 with those in panel 1, we see that the predicted work behavior of this wife is only trivially different from the baseline case. However, when the same $6,000 drop in the husband's income from t - 1 to t is due to a spell of unemployment in year t, we see from panel 6 that the probability of work rises essentially to 1 in $t-1$ and t, and then drops back slightly below the baseline level in $t+1$ and $t+2$. The expected hours of work if such a wife works are somewhat below the baseline case in all four years.

We turn our attention now to *starting work behavior* (the work behavior in t of those who did not work in $t-1$). As the baseline case for starting work behavior, we specify a hypothetical woman who has a probability of starting work in each year of .16, and who is expected to work 700 hours if she does start work in any

Table 7. Predicted Work Behavior for a Hypothetical Woman Who Worked in the Previous Year

	$t-1$	t	$t+1$	$t+2$
1. Baseline case				
Probability of work	.95	.95	.95	.95
Hours[a]	2,200	2,300	2,200	2,200
Earnings[a]	$8,800	$8,800	$8,800	$8,800
2. First baby in t				
Probability of work	.63	.28	.83	.88
Hours	1,806	1,870	2,095	2,140
Earnings	$7,224	$7,480	$8,380	$8,560
3. Other baby in t				
Probability of work	.89	.86	.83	.87
Hours	1,844	1,847	2,031	2,102
Earnings	$7,376	$7,388	$8,124	$8,406
4. Marriage of divorced women in t to husband with income of $6,000				
Probability of work	.98	.85	.89	.89
Hours	2,155	1,936	1,958	1,971
Earnings	$8,620	$7,744	$7,832	$7,884
5. Husband's income falls $6,000 from t – 1 to t, then returns to t – 1 level, without unemployment				
Probability of work	.95	.97	.94	.95
Hours	2,200	2,272	2,255	2,233
Earnings	$8,800	$9,088	$9,020	$8,932
6. Husband's income falls $6,000 from t – 1 to t due to unemployment in t, then returns to t – 1 level				
Probability of work	.99	1.00	.94	.92
Hours	2,061	1,914	1,976	2,067
Earnings	$8,244	$7,656	$7,910	$8,268

Note: [a]The actual hours and earnings figures are conditional on work in the given, as well as the previous, year. The earnings figures assume the wage rate is always $4 per hour.

given year. This baseline woman is also specified to have no young children and to be continuously married to a man who is never unemployed and who has an annual income of $6,000. The starting probability of work figures, and the figures for hours of work in year t conditional on work in t, but with no work in the year before that, are shown in the top panel of Table 8.

In the remaining panels of Table 8 we show the predicted starting work behavior for women identical in all respects to the baseline woman except for the occurrence of the specified events. These predicted work behavior figures were calculated using our probit and hours equation coefficient estimates for women who did not work in the previous year.

Table 8. Expected Work Behavior for a Hypothetical Woman Who did Not Work in the Previous Year

	$t-1$	t	$t+1$	$t+2$
		1. Baseline case		
Probability of work	.16	.16	.16	.16
Hours[a]	700	700	700	700
		2. Husband's income falls $6,000 from t – 1 to t, then returns to t – 1 level, without unemployment		
Probability of work	.16	.21	.16	.16
Hours	700	916	598	700
		3. Husband's income falls $6,000 from t – 1 to t due to unemployment in t, then returns to t – 1 level		
Probability of work	.50	.96	.14	.16
Hours	848	690	519	700
		4. Divorce in t with loss of $6,000 in husband's income and no remarriage in t + 1 or t + 2		
Probability of work	.61	1.00	.19	.19
Hours	667	1720	679	679
		5. First baby in t		
Probability of work	.12	.26	.15	.11
Hours	98	180	854	672
		6. Other baby in t		
Probability of work	.12	.14	.09	.11
Hours	483	792	652	672

Note: [a]The actual hours and earnings figures are conditional on work in the given, as well as the previous, year. The earnings figures assume the wage rate is always $4 per hour.

Comparing the figures in panel 2 with those in panel 1, we see that a $6,000 fall from $t-1$ to t in the husband's income that is not due to unemployment is predicted to be associated with only a modest rise in a wife's probability of starting work in year t, and has virtually no effect on her predicted starting work behavior in $t+1$ and $t+2$ if she does not work in t or $t+1$, respectively. From panels 3 and 4, however, we see that there are substantial predicted impacts on female starting work behavior when the losses of husband's income are associated with the events of either unemployment or divorce. Both of these events bring the probabilities of starting work in the year of the event up essentially to 1, with the probabilities of starting work also being elevated in the previous year. We also find that the expected starting hours of work in the year of the event are slightly *lower* than the baseline case for the event of the husband's unemployment, and *more than twice* the 700 hour figure for the baseline case for the event of divorce. Following the event year, the probabilities of starting work drop back essentially to the baseline level for both the events of the unemployment of the husband and divorce, with the expected hours of work if a woman does start work predicted to be at or below the baseline level. Thus, if a woman who was not working fails to start working in either the year before, or the year in which, her husband suffers a spell of unemployment or she becomes divorced, she is *not* more likely to start to work in subsequent years.

Finally from panels 5 and 6 of Table 8 we see that the predicted impacts on the probability of starting work of the birth of a first or higher parity baby in year t are relatively small and somewhat erratic. However, the expected hours of work if a woman does start work are greatly reduced in both $t-1$ and t by the birth of a first baby in t, and are reduced in $t-1$ by the birth of a higher parity baby in year t.

VIII. CONCLUSIONS

The results of this study imply that the work behavior of women is affected more by family related *events*—in particular, by the birth of a first child, by divorce, and by the event of a husband becoming unemployed—than by family related *states of being* such as being a mother, being a divorcee, or having an unemployed husband. For the three stated events, we find substantial impacts on a woman's labor supply not only in the event year, but also in the year prior to the event year. That is, we find evidence of anticipatory impacts of these events on female labor supply. If a woman does not change her work behavior in the year prior to, or in the year of an event such as a first birth, our estimation results suggest that she is *not* substantially more likely to do so in the year after the event. The coefficients of some of the more traditional states of being variables, such as the number of children 2 to 5 or the husband's income, are significantly different from zero, but are small in magnitude compared with the estimated impacts of the three event variables noted above.

Our results suggest that the failure to allow for anticipatory event effects (that is, $t+1$ effects associated with period t events) in studies of female labor supply will tend to spuriously augment the estimated coefficients of variables for states of being.

If even the current period event effects are not allowed for, the coefficient estimates for the corresponding state of being variables will be augmented even more.

Our estimates of the impacts of first versus higher order births strongly support the emphasis that Shapiro and Mott place on first births as important determinants or indicators of the long run work behavior of women. Also, these results confirm and extend our own earlier findings on the importance of allowing for differences in the impacts of explanatory variables on starting versus continuing work behavior. For example, in this study we find that the estimated impacts of a first birth in year t are particularly large for women who worked in $t-1$, while the estimated impacts of a divorce or the unemployment of the husband in year t are particularly large for women who did not work in $t-1$.

Our hope is that these results will encourage other researchers to explicitly allow for family related events in studies of female labor supply when the data available permit this, and will convince data collection agencies to include event variables in household surveys. For example, in the national censuses we would like respondents to be asked questions such as whether they got married or got divorced in the previous year rather than just whether they *are* married or *are* divorced at the time of the survey.

APPENDIX

Table A1. Probit and OLS Coefficient Estimates for Equations for the Probability of Work and for Hours of Work in Year t, U.S. Women 21–46

	Probits for Probability of Work		*Hours Equation*	
	Did not Work in $t-1$	*Worked in $t-1$*	*Did not Work in $t-1$*	*Worked in $t-1$*
Constant	−1.79[a]	−.85[a]	1223[a]	671[a]
	(4.16)	(1.70)	(3.13)	(5.20)
Dummy for no birth in $t-1$, t, or $t+1$		omitted category		
Dummies for first birth:				
In $t-1$	−.10	−.26	186	106
	(.36)	(.68)	(.88)	(1.13)
In t	.29	−1.74[a]	−488[a]	−81
	(.72)	(5.84)	(3.51)	(.42)
In $t+1$	−.19	−1.30[a]	−602[a]	−394[a]
	(.30)	(4.01)	(3.53)	(3.11)
Dummies for other birth:				
In $t-1$	−.38[a]	−.25	−16	56
	(1.97)	(1.11)	(.09)	(.62)
In t	−.11	−.13	−124	−126[a]
	(.58)	(.55)	(.79)	(1.33)

	Probits for Probability of Work		*Hours Equation*	
	Did not Work in $t-1$	*Worked in $t-1$*	*Did not Work in $t-1$*	*Worked in $t-1$*
In $t+1$	−.20	−.41[a]	−217[a]	−356[a]
	(.95)	(1.78)	(1.29)	(4.60)
Dummy for youngest child 2–5 in t	−.29[a]	−.25[a]	4	16
	(2.73)	(1.91)	(.04)	(.41)
Number of children younger than 18	.05[a]	−.10[a]	−32	−13
	(1.41)	(2.81)	(1.14)	(1.24)
Dummies for marital status in $t-1$, t, $t+1$:				
M,M,M		Omitted category		
M,M,D	1.28[a]	.67	−33	172
	(2.20)	(.37)	(.13)	(1.25)
M,D,D	1.09[a]	.35	906[a]	69
	(1.87)	(.68)	(5.97)	(.57)
M,D,M	.47	.51	606[a]	−41
	(.54)	(.56)	(3.97)	(.20)
D,D,D	−.06	−.31[a]	−135	−4
	(.34)	(1.58)	(.73)	(.08)
D,D,M	−2.72	.48	—	−45
	(.78)	(.77)		(.44)
D,M,M	−1.66	−.40	—	−153[a]
	(.49)	(1.15)		(1.30)
D,M,D	−2.29	1.04	—	−18
	(.35)	(.29)		(.14)
S,S,S	−.06	−.04	12	−27
	(.34)	(.15)	(.15)	(.53)
S,S,M	.49	2.13	185	27
	(1.28)	(1.16)	(.77)	(.18)
S,M,M	.11	−.22	874[a]	69
	(.25)	(.66)	(3.41)	(.76)
S,M,D	—	−.47	—	−520
		(.39)		(9.82)
Dummies for unemployment of husband in $t-1$, t, $t+1$:				
W,W,W		Omitted category		
U,W,W	−.07	.35[a]	−79	−62
	(.51)	(1.97)	(.57)	(1.18)
W,U,W	2.59[a]	3.10[a]	−226[a]	−275[a]
	(4.40)	(2.39)	(1.52)	(3.35)
W,W,U	1.00[a]	.91[a]	148	−139
	(2.74)	(1.84)	(.56)	(1.22)
U,U,W	−.00	.22	−190[a]	−15
	(.02)	(1.27)	(1.53)	(.31)

	Probits for Probability of Work		*Hours Equation*	
	Did not Work in t – 1	*Worked in t – 1*	*Did not Work in t – 1*	*Worked in t – 1*
U,W,U	–.09	–.29	98	125
	(.14)	(.79)	(.56)	(1.05)
W,U,U	—	–2.42[a]	—	–251
		(1.29)		(2.72)
U,U,U	–.05	–.09	29	–54
	(.35)	(.55)	(.21)	(1.11)
Husband's income in *t* (1000's of 1967 $)	–.03[a]	–.03[a]	–19[a]	–14
	(2.82)	(2.55)	(2.29)	(3.16)
Change in husband's income from *t* – 1 to *t* (1000's of 1967 $)	–.00	–.02	–17[a]	2
	(.27)	(.56)	(1.54)	(.33)
Years of schooling	.14[a]	.05[a]	–24	
	(5.03)	(1.73)	(1.18)	
Age	–.01[a]	.02[a]	.18	.13[a]
	(1.99)	(2.98)	(.02)	(2.04)
Dummy for black women	.14	–.27[a]	150[a]	–6
	(1.21)	(2.15)	(1.42)	(.20)
Dummy for receipt of AFDC assistance in *t* – 1	.10	–.10	–152	–179
	(.43)	(.28)	(.70)	(2.10)
Wage in *t* – 1	—	.06[a]	—	–20.45[a]
		(2.53)		(2.18)
Hours in *t* – 1	—	.001[a]	—	.600[a]
		(12.50)		(22.21)
Pseudo R^2, or R^2	.15	.38	.18	.46
Sample size	1,241	1,707	253	1,500
Mean of dependent variable	.21	.88	764	1497

Note: The data samples that were used are described in the text in Section III. Sample 1 was used for column 1, sample 3 was used for column 2, sample 2 was used for column 3, and sample 4 was used for column 4. For the marital status dummies, M denotes married (or living together), D denotes divorced (or separated), and S denotes single (never married). Widowed women were excluded because of the relatively few women younger than 47 who are widows. Thus S,M,D is a dummy variable set equal to 1 for women who were single in *t* – 1, married in *t*, and divorced in *t* + 1; and set equal to 0 otherwise. For the dummies for the employment/unemployment of husbands, U denotes that the husband had weeks of unemployment in the year and W denotes that he had weeks of employment and no weeks of unemployment. Thus W,U,W is a dummy variable set equal to 1 for women who had a husband who worked and had no unemployment in years *t* – 1 and *t* + 1, but who had one or more weeks of unemployment in *t*; and set equal to 0 otherwise including for women not married in *t* – 1, t, or *t* + 1.

The numbers in parentheses are the *t* statistics.

[a]Significantly different from zero with at least an 80 percent confidence level. The hours equation standard errors were corrected for heteroscedasticity with the ROBUSTSE option of the TSP package.

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REFERENCES

Becker, G. (1981), *A Treatise on the Family*. Cambridge, MA: Harvard University Press.

Duleep, Harriet Orcutt, and Seth Sanders (1994), "Empirical Regularities Across Cultures: The Effect of Children on Women's Work." *Journal of Human Resources* 29(2): 328–347.

Even, W.E. (1987), "Career Interruptions Following Childbirth." *Journal of Labor Economics* 5: 255–277.

Goldin, Claudia (1990), *Understanding The Gender Gap*, Cambridge: Cambridge University Press,

Johnson, W. R., and J. Skinner (1986), "Labor Supply and Marital Separation." *American Economic Review*: 455–469.

Klerman, Jacob Alex (1993), "Characterizing Leave for Maternity." RAND Labor and Population Program, Working Paper 93-94/RAND.

Klerman, Jacob Alex, and Arleen Leibowitz (1993), "Employment Continuity Among New Mothers." RAND Labor and Population Program, Working Paper: 93–33/RAND.

Klerman, Jacob Alex, and Arleen Leibowitz (1994), "The Work-Employment Distinction Among New Mothers." *Journal of Human Resources* 29(2): 277–303.

Leibowitz, Arleen, Jacob Alex Klerman, and Linda Waite (1991), *Women's Employment During Pregnancy and Following Birth*, RAND N-3392-DOL/NICHD.

Mincer, J. (1962), "Labor Force Participation of Married Women: A Study of Labor Supply." Pp. 63–97 in *Aspects of Labor Economics*, edited by H.G. Lewis. Princeton, NJ: Princeton University Press.

Mincer, J., and S. W. Polachek (1974), "Family Investments in Human Capital: Earnings of Women." Pp. 397–429 in *Economics of the Family*, edited by T.W. Schultz. Chicago, IL: University of Chicago Press.

Mott, Frank L., and David Shapiro (1978), "Pregnancy, Motherhood, and Work Activity." Pp. 29–56 in *Women, Work, and Family: Dimensions of Change in American Society*, edited by F.L. Mott. Lexington, MA: D.C. Heath and Co.

Mott, Frank L., and David Shapiro (1982), "Continuity of Work Attachment Among New Mothers." Pp. 80–101, 207–211 in *The Employment Revolution: Young American Women in the 1970s*, edited by F.L. Mott. Cambridge, MA: MIT Press.

Mott, Frank L., and David Shapiro (1983), "Complementarity of Work and Fertility Among Young American Mothers." *Population Studies* 37(2): 239–252.

Nakamura, Alice, and Masao Nakamura, (1985a), "Dynamic Models of the Labor Force Behavior of Married Women Which Can Be Estimated Using Limited Amounts of Past Information." *Journal of Econometrics* 27(3): 273–298.

Nakamura, Alice, and Masao Nakamura, (1985b), *The Second Paycheck: A Socioeconomic Analysis of Earnings*. Orlando: Academic Press.

Nakamura, Alice, and Masao Nakamura (1992), "The Econometrics of Female Labor Supply and Children." *Econometric Reviews* 11(1): 1–71.

Nakamura, Alice, and Masao Nakamura, (1994), "Predicting Female Labor Supply: Effects of Children and Recent Work Experience." *Journal of Human Resources* 29(2): 304–327.

O'Connell, Martin (1990), "Maternity Leave Arrangements: 1961–85." Pp. 11–57 in *Work and Family Patterns of American Women*. U.S. Bureau of the Census, Current Population Reports, Series P-23, No. 165. Washington, D.C.: Government Printing Office.

Polachek, S. W. (1981), "Occupational Self Selection: A Human Capital Approach to Sex Differences in Occupational Structure." *Review of Economics and Statistics*: 60–69.

Shapiro, David, and Frank L. Mott (1978), "Labor Force Attachment During the Early Childbearing Years: Evidence from the National Longitudinal Surveys of Young Women." *Annales de l'INSEE*: 30–31, 565–578.

Shapiro, David, and Frank L. Mott (1979), "Labor Supply Behavior of Prospective and New Mothers." *Demography* 16(2): 199–208.

Shapiro, David, and Frank L. Mott (1994). "Long Term Employment and Earnings of Women in Relation to Employment Behavior Surrounding the First Births." *Journal of Human Resources* 29(2): 248–275.

Shaw, Kathryn (1994), "The Persistence of Female Labor Supply: Empirical Evidence and Implications." *Journal of Human Resources* 29(2), 348–378.