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## Marital Status and Full-Time/Part-Time Work Status in Child Care Choices

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in Child Care Choices**

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## **ABSTRACT**

### **Marital Status and Full-time/Part-time Work Status in Child Care Choices**

Using recent SIPP data, we estimate two econometric models to study the differences in the effect of child care costs on employment status and differences in the mode of child care used controlling for employment status. For both married and single women, full-time employment is more elastic with respect to changes in the price of child care than part-time employment and employment elasticities are larger for single than married mothers. In the model of child care modal choice, we find that an increased probability of full-time employment is associated with an increase in the use of center care and a reduction in relative care for both married and single mothers, and that price elasticities of modal choice are larger for single than married mothers.

## **I: Introduction**

Policy makers at the federal and state levels are focusing currently on child care policy with an eye towards facilitating the welfare-to-work transition of single mothers, while also improving the availability, quality, and affordability of child care for families from all income brackets. In 1998, President Clinton outlined a package of child care proposals that included increased funding for the Child Care and Development Block Grant; increased funding for the Child and Dependent Care Tax Credit; increased funding for the Head Start and Early Head Start programs; Early Learning Challenge Grants; funding for after school programs and a Child Care Provider Scholarship Fund; Employer Child Care Tax Credits; and health, safety and research initiatives. This grab bag of programs was designed to influence the supply of, and demand for, quality child care services and to reduce the cost of child care for low and middle-income families. Congress has countered with numerous proposals of its own, and most recently, Presidential candidate and current Vice President Al Gore has proposed one year of full-day federally-funded preschool for all children, a policy that has already been implemented in a few states. This child care policy discussion comes on the heels of the 1996 reform of the federal welfare program that fundamentally changes the choices low-income single mothers can make, and substantially changes the costs of their child care options. State legislators are still working out the details of the welfare reform plan which calls for getting almost all former welfare recipients into the private labor market.

Despite this legislative interest in child care spending, much remains uncertain regarding the responses families will make to these proposed changes. This is not to say that researchers have not engaged this topic. In the past 15 years, economists and policy analysts have learned a great deal about the “economics of child care.” A number of researchers have estimated the

effects of the price of child care on labor supply decisions and on the choice of child care mode. Blau (1996) and Anderson and Levine (1999) summarize the estimates of the elasticity of labor force participation with respect to the price of child care from a large number of studies. Hofferth and Wissoker (1992) and Chaplin *et al* (1996) present thorough studies of the effect of child care price on the type of child care chosen by young women. Despite this research, the scope of the legislative changes being proposed is sufficiently broad, and the holes in the literature are large enough to justify further work. This view was echoed recently by the Council of Economic Advisers, which presented a list of needed research on child care in its December 1997 White Paper on child care. That list highlights the importance of more research on the child care choices of single women.

Our goals for this study include thoroughly examining the differences in the effect of child care prices on employment and child care mode choice by marital status and analyzing how the full-time/part-time employment choice interacts with child care utilization patterns by marital status. The focus on marital status in this paper is important because most of the early literature included only married women.<sup>1</sup> Those papers that have included single mothers have done so in a variety of ways. In a few papers, the analysis was performed separately for married and single mothers.<sup>2</sup> Alternatively, a full sample has been used that combines both married and unmarried mothers with marital status controlled with a dummy variable.<sup>3</sup> Hofferth and Wissoker (1992)

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<sup>1</sup> See Lehrer (1983), Connelly (1992), Ribar (1992, 1995). More recently, Averett et al (1997), Powell (1997, 1998a, 1998b) and Michalopoulos and Robins (1999) continue to focus on married women.

<sup>2</sup> See Connelly (1989), Michalopoulos, Robins and Garfinkel (1992), Kimmel (1998) Anderson and Levine (1999), Han and Waldfogel (1999).

<sup>3</sup> See Lehrer (1989), Leibowitz, Klerman, and Waite (1992), Folk and Beller (1993), GAO (1994), Fronstin and Wissoker (1994), Hotz and Kilburn (1994), Blau and Hagy (1996), and Chaplin *et al* (1996).

adjust for the number of choices of child care modes available to married and unmarried women (unmarried women do not have the option of husband care), but assume that “the relative probabilities of choices among available types of care are the same for married and unmarried women” (p.94). Finally, a few authors limit their analyses to single mothers.<sup>4</sup>

In this study, we consider the reasons married and unmarried mothers may make distinct choices about the mode of child care used, and in the amount they pay for child care. In our empirical model we examine differences in the effect of the price of child care on labor force participation decisions and mode of care choice. Because of the expected differences, we conduct our analyses of employment and mode of care separately for married and unmarried mothers. In addition, we explore how the price of child care and a woman’s employment status affect child care utilization patterns. Again, we separate the analysis between married and single mothers, expecting the interaction of employment, price of child care and modal choice to differ by marital status.<sup>5</sup>

Almost all the papers in this literature have studied only the discrete yes or no employment choice.<sup>6</sup> However, modes of care that are acceptable to support part-time employment may not be feasible for full-time employment, and so a switch from part-time to full-time work might be

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<sup>4</sup> Berger and Black (1992), Kimmel (1995), and Michalopoulos and Robins (2000).

<sup>5</sup> Throughout these empirical analyses, we treat marital status as endogenous, although from a theoretical perspective, it clearly is not. (See, for example, Becker 1974.) However, observed marriage decisions often pre-date current choices regarding employment and child care, and so any bias due to endogeneity should be small. Incorporating the endogeneity of marital status into our empirical analyses would make both models too cumbersome; therefore, stratifying the two samples up front by marital status is the most feasible way to show differences across marital states.

<sup>6</sup> Exceptions are Connelly (1989) and Michalopoulos, Robins, and Garfinkel (1992), who estimated hours of employment equations; and Folk and Beller (1993), Powell (1998b), and Michalopoulos and Robins (2000a, 2000b), who consider full-time/part-time status.

accompanied by changing child care demand. Transactions costs of looking for care and monitoring care may also differ by employment status. Thus, it is important to consider how child care costs and utilization patterns are interrelated with full-time/part-time/not employed status. Finally, since the choice to work part-time is relatively more feasible for married women, especially after welfare reform, we have yet another reason to separate our employment analyses by marital status.

The rest of the paper proceeds as follows. Section II briefly summarizes the economic framework of child care choice, concentrating on why marital status and employment status should matter. Section III describes the econometric strategy used in our analysis and Section IV introduces the data. Section V offers a descriptive portrait of child care use by married and single mothers. Our econometric results on employment status are presented in Section VI and the results on child care modal choice appear in Section VII. Section VIII concludes the paper.

## **II: Economic Framework for Joint Determination of Child Care Mode and Labor Supply: Why Marital Status and Employment Status Matter**

In our industrialized economy, it is nearly impossible to engage in market work while simultaneously caring for young children. Thus, if a mother is employed, someone else must care for her children during work hours. Formal behavioral modeling shows that labor supply decisions are made jointly with child care choices.<sup>7</sup> When the mother chooses to be employed in the formal labor market, she needs to arrange non-maternal care for her young children. Sometimes that care giver is a school teacher or day care employee, while at other times it is a relative or unrelated home day care provider. Because this list of potential child care providers

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<sup>7</sup>See Connelly (1992) for an explicit utility maximization model of mothers of young children.

includes the mother's husband and his relatives, we expect the child care arrangements of married mothers to differ from those of unmarried mothers. On the other hand, single mothers are more likely to live with other relatives.<sup>8</sup> In addition, financial resources differ across family structures, so we would expect single mothers to face greater constraints in their child care choices, though some government subsidy programs may be more available to single mothers. In this research, we extend the modal choice research by allowing the determinants of child care mode choice to differ by marital status.

Also intricately related to child care use patterns is the mother's choice of work hours. Full-time versus part-time status may affect the choice of child care mode. As mentioned above, transactions costs may differ for finding and monitoring full-time versus part-time care, and the modes of child care that are acceptable for a few hours of work per week may be unacceptable for more hours per week. Blank (1988) showed that female heads of household face significant fixed costs of work for relatively few hours worked per week. We suspect that child care needs account for a substantial amount of those "fixed" costs. Finally, relatives who may be available to provide part-time child care may not offer to supply full-time child care. Because of these potential differences, we control for the probability of full-time employment in predicting the variations in child care utilization patterns for both married and unmarried mothers.

Previous descriptive research has shown differences in the child care utilization patterns of married and unmarried mothers. Specifically, single mothers are more likely to rely on relative care (a less expensive form of care) than married mothers, and this stylized fact has been relied

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<sup>8</sup>In our sample, 8% of the married mothers with children under age 6 lived with another adult besides their spouses, compared with 47% of the single mothers.



upon in the estimates of child care costs that can be expected for those mothers making welfare-to-work transitions. However, other evidence suggests that this difference in modal choice is a consequence of low income and single mothers' greater likelihoods of working part-time and intermittently. If single mothers are expected to pursue full-time, year-round employment then perhaps this previous pattern of relative care may no longer be the single mother's first choice, and might even be infeasible given the unreliability of such care (see Kimmel [1994]).

### **III: Econometric Strategy**

We estimate two econometric models. The first considers the importance of child care costs (and therefore child care subsidies that reduce the price of care) on the choice among three employment states (full-time, part-time, or not employed) using an ordered probit model. This allows us to calculate the elasticities of full-time and part-time employment with respect to child care prices. The analyses are done separately for married and unmarried mothers, allowing us to answer the two-part question “Is the effect of the price of child care on employment different for full-time versus part-time work and different for married versus unmarried mothers?” The second econometric model, a multinomial logit model, relates to the first model by answering the question: “How does child care modal choice vary by child care prices and full-time employment?” Again the analyses are done separately for married and unmarried mothers.

For both models, we estimate a set of regressions. First, we estimate several preliminary regressions that we use to construct predicted prices of child care, predicted wages, and predicted probabilities of full-time employment. Then, we use the predicted measures in the two econometric models listed above. Our entire estimation strategy is summarized below, with an

outline provided in Appendix Figure 1.

In the first stage of the preliminary regressions, we construct a model of child care expenditures for use in predicting a child care price for each mother, including those not currently using paid child care. The point of constructing this predicted price measure is to examine the importance of the price of child care to the full-time/part-time employment choice. Since some families use more than one type of child care arrangement for a given child, and some have more than one preschool child, we considered a number of potential “prices.” For these analyses we chose the hourly expenditure on the primary child care arrangement of the youngest child as our measure of price. This definition allows us to look at both the effect of the price of child care on employment status and on modal choice for the youngest child. As always, the price we observe is really an expenditure that reflects parental choices of quality as well as true market prices. We control for quality differences only to the extent that they are correlated with the included explanatory variables in our price equation. In estimating this price equation, we implement a bivariate selection correction technique that has been used in many of the previous child care studies.<sup>9</sup> The bivariate selection corrects for only observing the price of child care for those mothers who are employed (selection 1) and who pay for care (selection 2).<sup>10</sup>

By constructing a predicted child care price for each mother in the sample, we assume implicitly that each individual has market (paid formal) care as an option. Previous work in this

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<sup>9</sup> See Tunali (1986) for its derivation and Connelly (1992), Ribar (1995), Kimmel (1998) and Powell (1998a,b) for examples of its use.

<sup>10</sup> In the specific SIPP waves from which our child care data are drawn, the child care expenditure questions were only asked of those employed, or in school or seeking employment mothers and were only asked for children under age 6.

area (Blau and Robins [1988], for example) assumed the opposite, that informal, unpaid care (typically provided by a relative) is an option for each person in the sample. Unfortunately, today, this is simply not true for many women. Moreover, in the case of low income single mothers, the alternative of free care is becoming less and less available because many of those free care providers were themselves involved in the welfare system, and so also now are being encouraged to engage in formal market work. Our predicted price accounts for the probability of having to pay for care. Because families differ substantially in their access to no cost care, it is important to include this in our estimated “price.”

A second preliminary equation is estimated to predict the market wage for each mother. This predicted wage reflects a potential market wage, based on relevant personal and market characteristics for all mothers in the sample, including nonworking mothers. As usual, it is corrected for potential sample selection bias. We do not incorporate child care subsidy eligibility or wages net of income tax information directly into our empirical analyses because such implementation is ad hoc at best and requires substantial assumptions concerning complicated program eligibility standards and annual earnings.

After estimating the wage and the price of child care for each woman in our sample, we use these estimated values in an ordered probit model constructed around a latent outcome reflecting work intensity preferences.<sup>11</sup> In this model, the dependent variable has three ordered categories of employment: not employed, employed part-time, and employed full-time. This strategy mirrors that of Powell (1998b) and allows us to estimate the importance of child care

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<sup>11</sup>See Greene (1997).

prices on full-time versus part-time employment, an extension of previous work that only calculates a single employment price elasticity.<sup>12</sup>

We address our second research question by focusing on the type of child care chosen. Here we estimate a multinomial logit model of child care modal choice in which there are three modes of child care available from which all employed mothers may choose: relative care (including father care); home-based care by a nonrelative (both in the child's home and in the care giver's home, sometimes called informal care); and center-based care (sometimes called formal care). This taxonomy of child care modes is fairly standard in the North American literature. Our model differs from previous ones in its inclusion of the predicted probability of working full-time conditional on the probability of being employed. Three different prices of care, one for each mode, are estimated in a set of preliminary regressions. These three predicted prices of care are constructed from those in the sample paying for that form of care, correcting for the sample selection that comes from having chosen that form of care.<sup>13</sup> The predicted price of care for each of the three modes is included in the explanatory variables vector for each of the three modes under the assumption that the price of all goods in the choice set matters for the choice of each mode. Since the included prices are predicted for each individual, differing in individual characteristics, household structure as well as state regulation climates, these three prices are all relevant decision-making variables in the choice of the mode of care. Also, because descriptive

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<sup>12</sup>Powell (1998b) estimates her model for married women in Canada. Folk and Beller (1993) also consider the effect of the price of child care on full-time and part-time employment. Our study differs from Folk and Beller's in our use of the ordered probit in order to improve control for the inherent order of these choices and our use of more recent data.

<sup>13</sup> The prices are not corrected for the employment selection nor for the selection of paying for care. This is not a serious drawback since our selection terms for employment and for paying for care in the earlier stage were statistically insignificant, and is a necessary simplification given the additional complexity of this second model.

analysis shows substantial differences in the amount paid for different types of care, we believe this model is useful for understanding modal choice and for answering our original research question, “How does child care modal choice vary by full-time/part-time employment and by the price of care?”<sup>14</sup>

#### **IV: Data, Variables and Equation Identification**

The Survey of Income and Program Participation (SIPP) data provide the newest nationally representative data set available with sufficient information on child care expenditures and mode as well as extensive employment information. Our data come from the overlapping 1992 and 1993 SIPP panels representing child care arrangements for the second half of 1994. We limit our sample to those women with at least one child under the age of six. In earlier papers, we used children under the age of 13 but subsequently have decided that the child care situation of school-aged children varies substantially from that of preschool children thus warranting the limitation of our sample to mothers of preschool children. This construction also corresponds to the child care data available in these SIPP panels. Our samples include 4241 married women and 1523 single women with at least one child under the age of six.

Variables used in our analyses include a set of demographic characteristics of the mother; a set of household composition variables; and a set of structural variables designed to capture differences in the labor market, the child care market, or transfer programs. The variables capturing the demographic characteristics of the mother include her educational level, her age, a

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<sup>14</sup> Strictly speaking, were the prices purely mode-specific, then the underlying theoretical model would imply that, for a multinomial logit model with three modes  $i$ ,  $j$ , and  $k$ , and mode  $i$  the excluded mode, the equation for mode  $j$  would include modal prices for just modes  $i$  and  $j$ . However, our prices are not purely mode-specific, but also functions of individual characteristics. Thus, within our model’s broader construct, where all prices reflect opportunity costs, our more complete equation specification is appropriate.

dichotomous variable indicating race, her nonlabor income (which includes husband's income in the case of married mothers and excludes all work-tied transfers for all mothers), and a dichotomous variable that indicates whether she suffers from a serious health problem, (*i.e.* she reports being in fair or poor health.) The set of household composition variables include the number or presence of children of various ages, 0–2, 3–5, 6–12 and 13–17, and the presence of other adults living in the household in addition to the mother and her husband. The set of structural variables includes dichotomous variables to indicate the following: urban residence, residence in a southern state, that the state's regulated child/staff ratio was better than 10:1 for three-year-olds in 1995, and the existence of any state regulations regarding education requirements for center teachers in 1994. Finally, the set of structural variables also includes the state's average Medicaid expenditures per enrollee in 1995, the mother's state of residence's average monthly AFDC payment per family in 1994, the estimated employer costs of the workers compensation insurance payments by state for 1994, adjusted for differences in industrial base<sup>15</sup>, and the state's monthly unemployment rate for 1994.

The unemployment and worker's compensation variables are expected to affect employment decisions and wages but not the price of child care. The two child care regulation variables are thought to affect the price and mode of child care, but not the mother's employment status once the price of care is controlled. Urban and southern residence are expected to affect the price of care, wages, and employment opportunities, but southern residence is not expected to affect the choice of care opportunities having controlled for prices of care, wages, and the

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<sup>15</sup>The state workers' compensation data were calculated by John F. Burton, Jr., Terry Thomason, and Timothy Schmidle and appear in table 1 of *Ed Welch on Workers' Compensation*, Michigan Edition, Volume 8, Issue 12, February, 1999.

probability of full-time employment. Finally, the Medicaid and welfare dummy variables are expected to affect single mothers as they relate to nonlabor income. For married mothers they may affect the general level of wages and labor market conditions, but are not expected to affect the choice of child care having controlled for the price of care, wages, and the probability of full-time employment.

Similarly, the mother's health status is thought to affect her wages, her employment status, and her probability of paying for care, but not to affect the price of care paid if she pays for care. As has become standard practice for early stages of estimation, second-order education and age terms, and education/age interaction terms are included while they are excluded in the structural models. (Mroz, 1987) Also, in early stages, the number of children of various ages is included as they should affect the relationship between age and work experience. In the later estimation stages, only the presence of children is included because it is thought that it is the presence of another child that should affect current decision-making regarding employment and the mode of child care used for the youngest child. While all exclusion decisions are somewhat *ad hoc*, we believe we have been careful and conservative with our choices, understanding well that empirical results often are affected by these choices (see Kimmel [1998] for evidence of this sensitivity).

For the dependent variables, we have already discussed the choice of variable used to represent the price of child care, that is, the hourly expenditure on child care for the youngest child's primary child care arrangement. We use the natural logarithm of this hourly expenditure to help account for the skewness in the distribution in hourly expenditures. If the expenditure for this arrangement is zero then this mother is categorized as not paying for child care. We collapse the detailed modes of care used by SIPP into three general categories. Relative care includes care

by the child's other parent/step-parent, the child's brother/sister, the child's grandparent, other relatives of the child, or if the mother works at home or cares for the child while at work. Home-based care includes care by a nonrelative of the child either at the care giver's home or at the child's own home. Center-based care includes care in a day/group care center, in nursery-preschool, in an organized school-based activity before/after school, or in kindergarten or elementary school. Finally, part-time employment is defined by working fewer than 35 hours a week, and the natural logarithm of hourly wages is used, with hourly wages defined as monthly earnings divided by monthly hours worked.

## **V: Descriptive Analyses**

Table 1 compares selected demographic characteristics of the married and single mothers in our sample. These descriptive statistics are weighted to represent national averages.<sup>16</sup> Looking at Table 1 and comparing the full sample of married mothers to single mothers we see that the single mothers are slightly younger and less educated. They differ substantially in their nonlabor income since this category includes husband's income in the case of the married women. As might be expected, single mothers have significantly fewer young children than married mothers, though the difference in each category is small. Single mothers are more likely to be nonwhite, and much more likely to be living below the poverty line. In fact, 80% of our single mothers have family income that is less than two times the poverty line, compared with 33% of married mothers. Single mothers who are employed have a lower incidence of poverty but still 26% of these single mothers live below the poverty line compared with 4% of married employed

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<sup>16</sup>A full set of unweighted means and standard deviations for all the variables used in all our regressions is available upon request.



mothers. The percentage who are receiving some type of welfare payment mirrors this difference in financial resources between the two samples as well as differences in eligibility. Forty-three percent of the single mothers are receiving welfare payments compared with 2% of married mothers.

The two groups also differ in employment characteristics. Single mothers have a lower probability of being employed: 47% compared to 55% for married mothers. Those mothers who are employed work a similar number of hours on average, though single mothers are less likely to work part-time. Also, married mothers earn approximately \$3.50 more per hour. The hourly wage difference between the groups probably reflects the differences in age and education seen above. However, access to reliable backup daycare may also contribute to the wage differential between the two samples indirectly by influencing the intermittence of work.

Finally, we find that the percent paying for child care from our samples of married and single women is essentially equal, with slightly more than half of all employed mothers paying for care. This was somewhat surprising to us since it was our sense that single mothers are more likely to use unpaid care. Further probing of the data revealed that while single mothers are more likely to use relative care, they are also more likely to pay for such care. In addition, married mothers working full-time are more likely to pay for care than single mothers, but married mothers working part-time are less likely to pay for care. The percentage paying for care differs substantially by employment intensity. Among married mothers, 62% of those employed full-time pay for care compared with 37% of those employed part-time. Similarly, 59% of single mothers employed full-time pay for care compared to 39% of those employed part-time.

Looking at only those women who pay for care, married mothers pay about one-third more than single mothers both by the week and by the hour. This is true for the full-time and part-time samples as well. Part of the difference in weekly expenditures may be due to difference in the percentage working part-time. For married and single mothers, those working full-time pay more per week but less per hour than those working part-time. The differences in expenditure amounts among the married and single mother samples show the complexity of thinking about a single price of child care, given that a substantial proportion of the sample pays no money, and given that some portion of the differences in expenditures represent parental choices made on the basis of quality or convenience.

Table 2 shows the differences in child care mode choice and weekly expenditures by mode of care and employment state for employed mothers. Of the married mothers whose youngest child is in relative care, 44.3% work part-time, compared with those whose youngest child is in either home-based care or center-based care ( 25.7% and 24% part-timers respectively). Modes of care also differ substantially in the price of care with center based care consistently the most expensive and relative care the least expensive. Considering only those who pay for care, weekly expenditures for home-based full-time care for married mothers who are employed full time is nearly as expensive as center-based care, but home-based care appears to be more variable by hours used than center-based care. Finally, married mothers spend more on each mode of care for both employment states than single mothers.

## **VI: Predicting the Effect of Child Care Price on Employment Status**

Regression results from the structural ordered probit model are given in Table 3 with corresponding price and wage elasticities given in Table 4. These were produced to answer our

first research question, “What is the effect of the price of child care on the decision of a mother of young children whether to be not employed, employed part-time or employed full-time?” The columns report the marginal effects (evaluated at the sample means) of the variables on the probability of being in each employment state for married and single mothers. Included in the vector of explanatory variables are the predicted hourly price of child care for the youngest child’s primary child care arrangement (calculated from the results shown in Appendix Table A), and the predicted wage (calculated from the estimated coefficients reported in Table B).

The effect of the predicted price of child care is significant for both the married and the single samples. In both groups, higher child care costs increase the probability of not being employed and lower the probability of being employed either part-time or full-time. The employment probability elasticities for the predicted price of child care evaluated at the sample means are presented in Table 4. Here we see that a 1% change in the hourly price of child care causes a larger predicted change in the employment probabilities for single mothers than for married mothers (-0.372 versus -0.082 for part-time employment and -1.221 versus -0.709 for full-time employment). And, for both married and single mothers, the price elasticity with respect to part-time employment is less than that of full-time employment. This indicates a substantial difference in the nature of part-time versus full-time employment for both groups but the magnitude of the elasticities seem to indicate that the price of child care is a crucial ingredient for part-time employment of single mothers just as it is for full-time employment, while for married women child care costs have very little effect on part-time employment status.

The elasticities of employment with respect to the price of child care reported in this table are well within the range of elasticities reported in other papers though they differ from most of

the other papers in that employment is split between full-time and part-time. Our married mothers' elasticities are very similar to Powell's estimate for Canadian married mothers using a very similar estimation strategy. (Powell's elasticity estimates in regard to price of care are -0.2 for part-time and -0.7 for full-time.)

For comparison purposes we also calculated the employment elasticities from a simple structural probit on employment (in which the dependent variable equals 1 if the mother is employed), and provide these estimates in the first row of Table 4. Our elasticities of -0.433 for married mothers and -1.030 for single mothers are in the same range as those reported in Anderson and Levine (1999), though our elasticity for single mothers is greater in absolute value making the difference between the marital groups more substantial. Anderson and Levine reported elasticities of employment with respect to the price of care of -0.46 and -0.59 for married and single mothers, respectively. Given the differences between studies it is unclear whether these elasticities differ because of our specification or because of our more recent data.

Among the other papers in this literature there has never been agreement on the relationship between the relative child care price elasticity of employment for married versus single women. Connelly (1989) predicted that the price of child care elasticity should be smaller (in absolute value) for married mothers, because married mothers were more responsive to the quality components of child care expenditures than single mothers. The larger the quality component of child care, the less elastic we expect the effect of child care prices on mother's labor market decisions to be. In that paper, Connelly found a significant negative effect of the price of child care on hours worked for single women, but no significant effect for married women. Kimmel (1998) estimated employment elasticities with respect to the price of child care

that fell in the opposite direction. Her estimated price elasticity of employment for single mothers is -0.22 compared with -0.92 for married women. Both of these papers included all women with children under 13 years of age. Han and Waldfogel (1999) and Anderson and Levine (1999), each using only mothers of children under age 6, estimated single mothers' elasticity to be greater in absolute value than married mothers. In this current analysis, we also use mothers with children under age 6 and we find support for the hypothesis that single mothers are more responsive in their employment probability to the price of child care. This is especially true in the case of the probability of part-time employment. By considering part-time employment separately from full-time employment, we are able to offer an alternative explanation for the differential in price sensitivities between married and single mothers of young children, that is, that there is a greater probability that single mothers will have to pay for care when engaging in part-time employment.

Table 4 also shows the predicted elasticities of employment with respect to wages. For both married and single mothers of young children, the predicted wage has the expected significant positive effect on the probability of employment and the effect of a change in wages has a much larger effect on the probability of full-time employment than on the probability of part-time employment. Our estimated wage elasticities for full-time and part-time employment for married and then single mothers are: 0.994, 0.116; 1.530, 0.467. Increasing the wage has very little effect on the probability of part-time employment for married mothers. It is not surprising that this pattern of wage elasticities mirrors the pattern of child care prices. Based on our behavioral model, increasing the price of child care has an effect similar to decreasing one's wages. The part-time employment decision of married women appears to have less to do with net

earnings than the full-time employment decision and is less wage and price elastic than either the full-time or part-time employment decision of single mothers.

Looking back to Table 3 at the other demographic characteristics of the mother beyond prices and wages, we find that for married mothers, nonlabor income is associated negatively with employment, while for single mothers, nonlabor income has a positive effect on employment. For single mothers, nonlabor income is mainly child support payments. Receipt of child support payments may proxy for stronger labor force connection of the mother through positive associative mating with a man who has stronger labor force connections. Single nonwhite mothers have a lower probability of employment, but race is not a significant predictor for married mothers. Married mothers who have a health problem are less likely to be employed, even having controlled for the effect of health on the predicted expenditure on child care, while the health variable is insignificant in predicting single mothers' employment.

Household structure variables also exert some significant influence on the probability of employment for married women but have no significant effect on our single sample. If the youngest child is an infant, married mothers are actually more likely to be employed given that we have controlled for the higher cost of child care for infants. Having two or more preschoolers has no effect on the probability of employment for either married or single mothers. Finally, married urban mothers are less likely to be employed and single mothers living in the south are more likely to be employed.

### **Predicting the Effect of Child Care Price and the Probability of Full-time Employment on the Mode of Child Care Used for the Youngest Child**

Table 5 presents the results of a multinomial logit model of child care mode choice. Our

model of child care mode choice includes three predicted prices of care, one for each mode. The model also includes the predicted conditional probability of full-time employment, that is, the probability of working full-time given that the woman is working. This variable was predicted from an ordered probit model similar to that presented in Table 3.<sup>17</sup> The rationale for including this predicted value is the hypothesis that certain forms of child care (particularly relative care) may be acceptable for part-time employment but either would not be acceptable or would not be available if one were employed full-time. The three predicted prices for child care for each mother, the predicted ln(hourly price of relative care), the predicted ln(hourly price of home-based care), and the predicted ln(hourly price of center-based care) are estimated by running three child care expenditure equations using information from those mothers using that particular form of care. For example, 389 mothers paid for home-based care, while 249 mothers paid for relative care, and 839 mothers paid for center-based care. The full set of results for these child care price equations is given in Appendix Table D. Since parents who choose a particular mode of child care may have access to lower priced care of that type than parents who do not use that mode of care, we have corrected our price equations for this type of sample selection bias using a multinomial selection model based on Lee (1983), and similar to that used by Powell (1998a).<sup>18</sup> This strategy corrects for the selection that might come from mode choice but it does not correct

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<sup>17</sup> The predicted conditional probability of full-time employment comes from a reduced form ordered probit presented in Appendix Table E. The structural ordered probit results discussed earlier cannot be used for this construction because it relies on a single (modal average) price of care which, while appropriate for that model, is not appropriate for the model of modal choice.

<sup>18</sup> It is also similar to Hofferth and Wissoker (1992) although they use probit-based selection terms while we use multinomial logit-based selection terms.

for the selection of being in the labor force or the selection of paying for care.<sup>19</sup> The latter issue, the selection of paying for care seems most problematic in the case of relative care. We tried several alternative methods for correcting for selection in the estimation of the relative care price. The results using these alternative methods were not substantively different from those presented here. We should note that none of the selection terms are significant in the three price equations.

Table 5 presents the marginal effects of the included variables on the probability of choosing among the three modes of employment. The analysis is limited to employed mothers because we do not observe the modal choice of non-employed mothers. This may create another type of sample selection bias but it is difficult to control for in this context. For both married and single mothers of young children, many of the variables included in the analysis appear to have a systematic effect on mode of child care choice.

The predicted probability of full-time employment is significant for both married and single mothers. That is, increasing the probability of full-time employment is associated with an increase in the probability of using center-based care and a reduction in the probability of relative care. This is an important finding since it is the first time that we know of that this variable has been included in an analysis of modal choice. Whether the choice of center care to facilitate full-time employment is related to the parent's preferences for the developmental approach of center-based care or the dependability of this form of child care is uncertain, but this result implies that as full-time employment of mothers increases, the demand for center-based care especially for infants will increase.

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<sup>19</sup> The reduced form multinomial logit which was used to create the selection terms in these equations is presented in Appendix Table C.



The price of home-based care and the price of center-based care operate as we would have expected for both samples of mothers. Increasing the predicted log price of center-based child care reduces the probability of using that mode of care and increases the probability of using relative care. Increasing the predicted log price of home-based care significantly increases the probability of using center care. Increasing the price of home-based care also reduces the probability of using relative care and home-based care for both samples though the precision of the estimates varies. Perhaps this is because some relatives are paid the going rate for home-based care, although the majority of relatives are not paid. The estimate of the effect of price of relative care are less satisfying with no significant effects, but this is not that surprising given the difficulty of predicting who will have to pay relatives and who has relatives available. The SIPP data are not well equipped to answer either of these questions.

Table 6 presents elasticities calculated from the marginal effects in Table 5. These elasticities allow us to compare the relative sensitivity of price to mode choice for married and single mothers. As in the employment choice, single mothers appear to be more elastic in their choice of mode. For example, the own price elasticity of center-based care is -2.3 for married mothers and -4.0 for single mothers.

Considering now other household and personal characteristics of the mothers, in both samples, mothers with younger children have higher probabilities of using relative or home-based care as opposed to center-based care. Having an additional preschooler at home is also a significant predictor of mode choice for both groups--mothers with another preschooler at home are more likely to choose center-based care for the youngest child and less likely to use relative care. Having a school-aged child has a very different effect on modal choice from having another

preschooler. Having a school-aged child increases the probability of using home-based care and relative care for married mothers and reduces the probability of using center-based care. There is no significant effect of having a school aged child for single mothers. Perhaps for married mothers home-based providers or relatives are providing some after-school care as well while having two preschoolers may be too much for an elderly grandparent to handle.

Higher nonlabor income increases the probability of using center-based care and reduces the probability of using relative care for married mothers but not single mothers. Higher income families may have relatives with higher income and higher potential earned income who are less willing to provide care for young children. One might have expected this same effect from the mother's wage but it appears that any income effect of that type is swamped by the needs for more flexibility that higher wage women in the labor market require. Increases in the predicted wage (holding everything else constant) reduce the likelihood for using center based care for both samples, increase the probability of single mothers using relative care and married mothers using home-based care. Among the variables being held constant are age and education. Older women and women with higher levels of education are more likely to use center-based care. Perhaps these mothers place a higher value on center-based care's developmental approach or perhaps the differences reflect higher real incomes.

The nonwhite dummy is a significant positive predictor of relative-based care use and a significant negative predictor of center based care. It is unclear whether this has to do with availability of relatives, the availability of centers in the neighborhood or parental preferences. Living in an urban area may be correlated with increased availability of centers and the effect is to increase the probability of using a center for both samples. Having another adult in the household

(beyond the spouse in the case of married mothers) and having a teenager in the household are certainly both related to the availability of relatives. Having another adult in the household or having a teenager increases the probability of using relative care and decreases the probability of using center based care. Availability does seem to be an important factor of mode choice.

## **VIII: Conclusions**

This paper had two main objectives and asked two research questions. The objectives were to compare systematically the child care decision-making of single and married mothers, to expand the analysis of employment to include three employment states (not employed, part-time employed and full-time employed). Stemming from our interest in comparing married and single mothers, we asked the question “Is the effect of the price of child care on employment different for full-time versus part-time and different for married versus unmarried mothers?” Arising from our sense that full-time and part-time employment may have very different effects on a family’s demand for different types of child care arrangements we asked “How does child care modal choice vary by full-time/part-time employment?”

Our results rely on obtaining information on the variation in child care prices faced by families from the families’ own expenditures on child care. While others have argued for independently-obtained average area prices such as those available from the National Child Care Survey, the SIPP data are the data that will be available to child care researchers on a regularly updated basis. In addition, the SIPP data on child care expenditure are linked more closely with the characteristics of the family. Our estimated hourly price of child care for the youngest child is a significant predictor of employment for both married and single mothers. The estimated

elasticities of employment (yes/no) presented in Table 4 are very much in the range of the estimates from other studies.

In addition to estimating these elasticities of being employed (yes/no), our estimation strategy allows us to differentiate between the elasticity of full-time employment with respect to the price of care and the elasticity of part-time employment with respect to the price of care. Based on a model of family decision-making regarding labor supply and child care choice, and based on the descriptive statistics in Table 2 that showed a greater reliance on relative care by mothers who were employed part-time, we expected to find differences in the elasticities of part-time employment and full-time employment with respect to the price of child care. Similarly, based on the same model of family decision-making and on the descriptive statistics that showed substantial differences in weekly expenditures on child care and on the distribution of modes of child care used (also in Table 2), we expected to find differences in the elasticity of employment between married and single mothers. Table 4 summarizes our estimated elasticities for both sets of these comparisons. For both married and single women, the effect of child care prices on part-time employment is very different from the effect of those same prices on full-time employment. The wage elasticities show a similar pattern. Comparing married and single mothers, our prediction of a greater (in absolute value) sensitivity to the price of child care for single mothers is borne out.

Our second research question began at this point, “Given that full-time and part-time employment are somewhat different phenomena, do the differences affect the mother’s choice of child care used in conjunction with employment?” Here we limited our analysis to employed mothers of young children. The answer to this question appears to be yes. We found that for

both married and single mothers, those who were more likely to work full-time were more likely to use center-based care and less likely to use relative care. The estimates of the price of center-based care and the price of home-based care were “well behaved” in their predicted effects on the mode of child care choice while our predicted price of relative care did not inspire much confidence. This is not surprising given that the key factors in relative care seem to be availability of relatives and their perceived appropriateness as care providers. Price elasticities of mode choice showed that single mothers are more elastic in their mode choice than married mothers.

The policy implications of our full set of findings are important especially for single mothers. As changes induced by welfare reform work through the system and women reach their federally mandated maximum five years of reciprocity, we would expect the probability of full-time employment to increase substantially for single mothers. Our results indicate that this will involve a move away from relative care toward center-based care. We have also shown that part-time employment for single mothers is sensitive to changes in the price of child care and wages, though still less sensitive than full-time employment. Paid part-time child care is often more expensive per hour than full-time child care, increasing the negative effect of child care costs on the employment of single mothers. For married mothers, part-time employment is particularly insensitive to the price of child care, perhaps due to the heavy reliance on fathers and other relatives for child care to facilitate part-time employment.

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## **Appendix Figure 1**

### **Summary of Estimation Strategy**

#### I. Preliminary Estimation (merged samples)

- A. Regressions to construct predicted wage:
  - 1. reduced form employment probit: use to construct inverse mills ratio (IMR)
  - 2. wage equation (with IMR included): use results to construct predicted wages for each individual.
  - 3. Result is a predicted wage for each mother.
  
- B. Regressions to construct single predicted prices of care for ordered probit
  - 1. reduced form bivariate probit (employment and pay for care); use results to construct bivariate version of IMR.
  - 2. price of care equation (with BIMR included); use results to construct predicted prices of care for each individual.
  - 3. Result is a predicted price of care for each mother.
  
- C. Regressions to construct the three predicted prices of care for multinomial logit
  - 1. reduced form multinomial logit to explain the probability of choosing each of the three types of care; use results from this regression to construct three separate inverse mills ratios.
  - 2. Price of care equations (with specific IMR included); use results to construct predicted prices of care for each individual for each of the three prices of care.
  - 3. Result is a predicted price of care for each mother for each of three modes.
  
- D. Regression to construct predicted probability of full-time employment
  - 1. reduced form ordered probit on the three employment states (full-time, part-time, not employed); use results to construct the predicted probability of full-time employment.
  - 2. Result is a predicted probability of full-time employment for each mother, conditional on being employed.

#### II. Primary estimation (estimation done separately by marital status)

- A. Ordered probit model of full-time and part-time employment
  - 1. key regressors: predicted wage; predicted price of care.
  - 2. calculate elasticities for above.
  
- B. Multinomial Logit model of child care modal choice
  - 1. key regressors: predicted wage; three predicted prices of care; predicted probability of full-time employment.
  - 2. calculate elasticities for above prices.

**Table 1. Means and Standard Deviations for Demographic and Employment Variables<sup>a</sup>**

Variables	MARRIED			SINGLE		
	All	Employed	Employed, Pay for Care	All	Employed	Employed, Pay for Care
# of observations	4,241	2,350	1,282	1,523	738	395
<b>Demographics:</b>						
Age	31.46 (5.85) <sup>b</sup>	31.52 (5.59)	31.70 (5.45)	28.01 (6.82)	28.48 (6.65)	28.56 (6.22)
Education	13.31 (2.67)	13.77 (2.47)	14.15 (2.37)	11.82 (2.12)	12.50 (1.96)	12.55 (2.11)
Nonlabor Income	2947.66 (2169.88)	2769.41 (1974.27)	2918.78 (2002.74)	849.96 (1536.21)	919.65 (1665.34)	849.56 (1577.61)
# Children age 0-2	0.64 (0.61)	0.61 (0.59)	0.64 (0.58)	0.59 (0.59)	0.50 (0.54)	0.52 (0.54)
# Children age 3-5	0.75 (0.63)	0.68 (0.59)	0.65 (0.57)	0.72 (0.63)	0.65 (0.56)	0.65 (0.57)
Nonwhite	0.12 (0.32)	0.13 (0.34)	0.12 (0.32)	0.39 (0.49)	0.35 (0.48)	0.32 (0.47)
Poverty	0.11 (0.32)	0.04 (0.18)	0.02 (0.12)	0.55 (0.50)	0.26 (0.44)	0.23 (0.42)
2 ×Poverty	0.33 (0.47)	0.19 (0.40)	0.13 (0.34)	0.80 (0.40)	0.67 (0.47)	0.62 (0.49)
Welfare	0.02 (0.13)	0.003 (0.06)	0.002 (0.04)	0.43 (0.49)	0.11 (0.32)	0.08 (0.27)
<b>Employment:</b>						
Proportion in LF	0.55 (0.50)	-	-	0.47 (0.50)	-	-
Part-time	-	0.33 (0.47)	0.22 (0.42)	-	0.27 (0.45)	0.20 (0.40)
Weekly work hours	-	34.79 (11.42)	37.16 (9.17)	-	35.60 (10.06)	37.16 (9.10)
Hourly wage	-	11.56 (7.88)	12.61 (7.76)	-	8.25 (5.43)	8.96 (6.11)
<b>Child care:</b>						
Proportion paying for care	-	0.54 (0.50)	1.00	-	0.53 (0.50)	1.00
Weekly child care \$ for youngest child	-	-	77.47 (43.15)	-	-	57.58 (33.70)
Hourly child care \$ for youngest child	-	-	2.24 (1.56)	-	-	1.65 (1.20)

a. These means and standard deviations are weighted to obtain population averages using the "topical modal" weights supplied by SIPP

b. Standard deviations are shown in parentheses.

**Table 2. Child Care Mode Choice and Weekly Expenditures by Mode of Care for Employed Mothers<sup>1</sup>**

	MARRIED		SINGLE	
	Employed full-time	Employed part-time	Employed full-time	Employed part-time
<b>Weekly expenditure on child care for each mode for those who pay for care:</b>				
Relative care	\$64.83	\$51.75	\$49.35	\$43.01
Home-based care	\$87.85	\$70.71	\$61.10	\$53.65
Center-based care	\$88.79	\$79.91	\$70.05	\$60.32
<b>Percentage using each child care mode:</b>				
Relative care	37.2	59.2	41.8	52.5
Home-based care	23.4	15.5	17.9	16.1
Center-based care	39.4	25.4	40.3	31.4
<b>Of those who use each mode, percentage who pay for it:</b>				
Relative care	21.0	8.3	32.5	17.5
Home-based care	97.6	89.7	91.5	87.6
Center-based care	80.5	72.1	70.8	50.2

<sup>1</sup> These means are weighted to obtain population averages using the "topical modal" weights supplied by SIPP. All numbers relate to care arrangements for each employed mother's youngest child except for weekly expenditure figures or where indicated otherwise.

**Table3. Marginal Effects from Structural Ordered Probit Model of Employment State**

	MARRIED (n=4241)			SINGLE (n=1523)		
	Not employed	Part-time	Full-time	Not employed	Part-time	Full-time
Constant	0.397***	-0.022***	-0.375***	0.741***	-0.077***	-0.664***
Predicted price of care	0.277***	-0.015***	-0.262***	0.478***	-0.050***	-0.428***
Predicted wage	-0.389***	0.021***	0.367***	-0.599***	0.063***	0.536***
Nonlabor income	3E-5***	-2E-6***	-3E-5***	-2E-5**	2E-6**	2E-5**
Nonwhite	-0.040	0.002	0.038	0.121***	-0.013***	-0.108***
Unhealthy	0.064*	-0.004*	-0.060*	0.051	-0.005	-0.045
Infant in Family	-0.044**	0.002**	0.042**	0.002	0.000	-0.002
Presence of Other Preschoolers	0.045	-0.003	-0.043	0.046	-0.005	-0.041
Urban Residence	0.041**	-0.002**	-0.039**	0.038	-0.004	-0.034
Southern Residence	-7E-4	0.001	7E-4	-0.072*	0.008*	0.065*
State's average Medicaid expenditure per enrollee	1E-5	-5E-7	-9E-6	-1E-6	-1E-6	1E-6
State's average monthly AFDC payment per family	3E-5	-2E-6	-3E-5	2E-4	-2E-5	-2E-4

a. Table values are the marginal effects from ordered probit evaluated at the sample means. The estimation provides only one set of coefficients so significance level of the coefficient \* is indicated by the stars. (Thus the variable is either a significant predictor of employment or not.) t statistics are in parentheses.

b. Significance level: \* - 10%; \*\* - 5%; \*\*\* - 1%

**Table 4. Estimated Elasticities of Employment with Respect to the Price of Child Care and Wages**

	MARRIED		SINGLE	
	Price of care	Wage	Price of care	Wage
Employed or not <sup>a</sup>	-0.430**	0.724***	-1.030***	1.230***
Employment status:				
Not employed <sup>b</sup>	0.622***	-0.872***	0.927***	-1.162***
Part-time	-0.082***	0.116***	-0.372***	0.467***
Full-time	-0.709***	0.994***	-1.221***	1.530***

*Note:* Elasticities are evaluated at the sample mean for all variables. In each case, \*\*\* indicates that the corresponding price or wage coefficient is significant at the one percent level.

<sup>a</sup>Output used for this calculation is not included in the paper, but comes from a standard employment probit equation estimated using the same variables as in Table 3.

<sup>b</sup>Output used for this calculation is shown in Table 3.

**Table 5. Marginal Effects of the Probability of Choosing Among Modes of Care for the Youngest Child for Employed Mothers (Multinomial Logit Estimation Including Three Separate Predicted Prices of Child Care)**

	MARRIED (n=2350)			SINGLE (n=738)		
	Relative	Home-based	Center-based	Relative	Home-based	Center-based
Constant	1.945*** (6.66)	0.075 (0.34)	-2.021*** (-6.73)	3.338*** (3.79)	0.497 (0.81)	-3.835*** (-4.08)
Predicted probability of full-time employment	-1.645*** (-4.07)	-0.360 (-1.14)	2.005*** (4.96)	-3.141*** (-3.17)	-0.258 (-0.37)	3.398*** (3.34)
Predicted price of relative care	0.1109 (0.90)	0.144 (1.51)	-0.254** (-2.19)	0.119 (0.49)	0.083 (0.47)	-0.202 (-0.85)
Predicted price of home-based care	-0.337* (-1.74)	-0.223 (-1.45)	0.559*** (3.01)	-0.662 (-1.29)	-0.798** (-1.98)	1.459*** (2.83)
Predicted price of center-based care	0.707*** (3.37)	0.099 (0.61)	-0.807*** (-4.02)	1.086** (2.45)	0.440 (1.31)	-1.526*** (-3.32)
Predicted wage	0.122 (0.72)	0.328** (2.35)	-0.450*** (-2.77)	1.095*** (2.66)	0.204 (0.68)	-1.299*** (-3.13)
Education	-0.034** (-2.23)	-0.020 (-1.63)	0.054*** (3.69)	-0.108*** (-2.81)	0.043 (-1.55)	0.151*** (3.78)
Age	-0.017** (-2.46)	-0.012** (-2.10)	0.029*** (4.31)	-0.042** (-2.37)	-0.000 (-0.02)	0.043** (2.44)
Nonwhite	0.087* (1.84)	0.010 (0.26)	-0.098** (-2.19)	0.244*** (2.91)	-0.029 (-0.48)	-0.215*** (-2.61)
Nonlabor income	-8E-5*** (-4.83)	3E-6 (0.24)	8E-5*** (4.91)	-4E-5 (-0.97)	3E-6 (0.09)	4E-5 (0.92)
Youngest child is an infant	0.054* (1.89)	0.143*** (5.57)	-0.197*** (-6.79)	0.116* (1.87)	0.108** (2.23)	-0.224*** (-3.45)
Presence of other preschoolers	-0.215*** (-3.98)	-0.006 (-0.15)	0.221*** (4.23)	-0.338* (-1.87)	0.033 (0.25)	0.305* (1.71)
Presence of children ages 6-12	0.102** (2.11)	0.098** (2.50)	-0.199*** (-4.26)	0.087 (0.89)	0.066 (0.93)	-0.152 (-1.58)
Presence of children ages 13-17	0.185*** (3.40)	0.112*** (2.58)	-0.298*** (-5.57)	0.570*** (3.70)	-0.030 (-0.28)	-0.540*** (-3.55)
Presence of other adults	0.363*** (5.19)	-0.100 (-1.63)	-0.264*** (-3.90)	0.229** (1.99)	-0.027 (-0.33)	-0.201* (-1.81)
Urban residence	-0.022 (-0.57)	0.087*** (-2.77)	0.109*** (2.91)	-0.291** (-2.23)	0.025 (0.26)	0.267** (2.06)
State's average Medicaid expenditure per enrollee	-	-	-	-7E-6 (-0.21)	1E-5 (0.53)	-6E-6 (-0.19)
State's average monthly AFDC payment per family	-	-	-	6E-4 (-1.57)	3E-4 (0.97)	3E-4 (0.86)

Notes: Table values are the partial derivatives evaluated at the sample means. t statistics for the estimated coefficients are in parentheses.

Significance level: \* 10%; \*\* 5%; \*\*\* 1%

**Table 6: Elasticities of Mode of Child Care Choice with Respect to the Mode Price of Child Care**

	Married Mothers			Single Mothers		
	Relative care	Home-based care	Center-based care	Relative care	Home-based care	Center-based care
Single Mode Price	-0.414*	-4.778	2.749	1.284	-0.622*	-1.239
Price of relative care	0.250	0.691	-0.723**	0.270	0.462	-0.533
Price of home-based care	-0.764*	-1.068	1.593***	-1.503	-4.426***	3.846***
Price of center-based care	1.605***	0.477	-2.297***	4.226**	2.439	-4.021***

*Note:* Significance level: \*10%; \*\* 5%; \*\*\* 1%.

**Table A. Determinants of the Probability of Paying for the Primary Child Care Arrangement of the Youngest Child and the Amount Paid for that Care**

	Pay for Care (n=5764)	Natural Logarithm of Hourly Price of Child Care (n=1677)
Constant	-0.946** (-2.30)	-0.981*** (-3.57)
Education	0.886 (1.86)*	0.033*** (2.76)
Age	0.076*** (2.97)	0.016*** (4.77)
Nonwhite	-0.066** (-2.47)	-0.123** (-2.37)
Nonlabor income	0.001** (2.36)	0.000*** (2.77)
Youngest child is an infant	0.078*** (3.40)	0.099** (2.00)
Number of other preschoolers	0.044 (1.43)	0.244*** (5.29)
Number of children ages 6-12	-0.008 (-0.41)	-
Presence of children ages 6-12	-	-0.136*** (-3.38)
Presence of children ages 13-17	0.003 (0.07)	-0.167*** (-2.64)
Presence of other adults	-0.127*** (-4.28)	-0.119 (-1.27)
Unhealthy	0.038 (0.84)	-
Urban residence	-0.068*** (-3.00)	0.167*** (3.59)
Southern residence	0.069** (2.08)	0.002 (0.03)
State's regulated child:staff ratio <10:1	0.006 (0.24)	0.099** (2.48)
State regulated center teachers' education	-0.009 (-0.39)	0.089** (2.28)
State's average Medicaid expenditure per enrollee	-0.003 (-2.58)	0.000 (0.61)
State's average monthly AFDC payment per family	1E-4 (1.10)	4E-4* (1.91)
Married	-0.123*** (-4.37)	0.067 (0.74)
Correlation coefficient	-0.687*** (-5.22)	-
Lambda from YESPAY	-	-0.031 (-0.09)
Lambda from LFP	-	0.039 (0.23)
Adjusted R-squared	-	0.233

*Notes:* Table values are partial derivatives from Bivariate Probit for YESPAY, and coefficients from the OLS Price Equation. t statistics are in parentheses. Significance level: \* - 10%; \*\* - 5%; \*\*\* - 1%. These results are used to construct the predicted price of child care for each mother in the sample, which is used in the structural ordered probit shown in Table 3.



**Table B. Determinants of the Probability of Being Employed and the Hourly Wages (Probit Model for Employment and OLS Selection Equation for Hourly Wages)**

	LFP n=5764	Natural Logarithm of Hourly Wage n=3088
Constant	-2.748*** (-3.26)	-1.989*** (-6.07)
Education	0.186* (1.92)	0.108*** (16.25)
Age	0.178*** (3.67)	0.132*** (7.01)
Age-squared	-0.003*** (-3.60)	-0.002*** (-5.67)
Education-squared	-2E-4 (-0.06)	-
Education * age	-0.009** (-2.10)	-
Education * age-squared	1E-4** (2.17)	-
Education-squared * age	1E-5 (0.12)	-
Nonwhite	-0.027 (-1.36)	-0.031 (-0.92)
Unhealthy	-0.190*** (-6.69)	-0.245*** (-3.90)
Nonlabor income	-4E-5*** (-9.93)	-
Number of children	-0.099*** (-10.64)	-0.120*** (-6.43)
Number of children ages 0-2	-0.097*** (-6.05)	-
Number of children ages 3-5	-0.076*** (-4.64)	-
Presence of children ages 13-17	0.129*** (4.76)	-
Presence of other adults	0.070*** (3.32)	-
Urban residence	-0.003 (-0.18)	0.114*** (4.14)
Southern residence	-0.008 (-0.33)	-0.051** (-1.98)
Unemployment rate	-0.031*** (-4.02)	0.020* (1.73)
State's regulated child:staff ratio <10:1	0.005 (0.22)	-
State regulates center teachers' education	0.041** (2.45)	-

**Table B (continued)**

	<b>LFP n=5764</b>	<b>Natural Logarithm of Hourly Wage n=3088</b>
State's average Medicaid expenditure per enrollee	-2E-5*** (-2.83)	-
State's average monthly AFDC payment per family	2E-5 (0.18)	-
Employers estimated workers' comp. payments by state	-7E-4 (-0.05)	-0.003 (-0.18)
Married	0.077*** (3.79)	0.057* (1.90)
Lambda	-	0.438*** (5.284)
Adjusted R-squared	-	0.266

*Notes:* Table values are partial derivatives from reduced form Probit LFP, and coefficients from the OLS Wage. Significance level: \*10%; \*\* 5%; \*\*\* 1%. These results are used to construct a predicted wage for each mother, which is used in the structural ordered probit (Table 3) and structural multinomial logit (Table 5).

**Table C. Determinants of the Probability of Choosing Among Modes of Care for the Youngest Child for Employed Mothers (Reduced Form Multinomial Logit Estimation; n=3088)**

Variable	Relative	Home-Based	Center-Based
Constant	1.222*** (4.04)	0.299 (1.27)	-1.521*** (-4.97)
Predicted probability of full-time employment.	-1.423*** (-3.05)	-0.580 (-1.58)	2.002*** (4.27)
Predicted wage	0.045 (0.24)	0.323** (2.22)	-0.368** (-2.11)
Education	-0.005 (-0.34)	-0.017 (-1.37)	0.023 (1.11)
Age	-0.008 (-1.60)	-0.006 (-1.45)	0.014*** (2.94)
Nonwhite	0.063** (2.25)	-0.046* (1.88)	-0.018 (-0.67)
Nonlabor income	-5E-5*** (-4.59)	-4E-6 (-0.46)	5E-5*** (5.03)
Unhealthy	-0.119** (-2.05)	-0.006 (-0.12)	0.125** (2.19)
Youngest child is an infant	0.106*** (4.65)	0.114*** (5.80)	-0.220*** (-9.16)
Number of other preschoolers	-0.041 (-1.18)	-0.046* (-1.65)	0.088** (2.45)
Number of children ages 6-12	-0.016 (-0.75)	0.015 (0.87)	0.001 (0.044)
Presence of children ages 13-17	0.092** (2.08)	0.065* (1.86)	-0.157*** (-3.69)
Presence of other adults	0.195*** (5.61)	-0.064** (-2.21)	-0.132*** (-3.93)
Urban residence	0.043 (1.21)	-0.084*** (-3.01)	0.041 (1.21)
Southern residence	-0.100*** (-2.87)	-0.067** (-2.43)	0.167*** (4.97)
State's regulated child:staff ratio <10:1	0.026 (0.97)	-1E-4 (-0.01)	-0.026 (-1.02)
State regulates center teachers' education	0.034 (1.42)	-0.018 (-0.94)	-0.016 (-0.70)
State's average Medicaid expenditure per enrollee	-1E-6 (-0.13)	-2E-5** (-2.52)	2E-5** (2.21)
State's average monthly AFDC payment per family	-2E-4 (-1.18)	-1E-4 (-1.33)	3E-4** (2.26)
Married	0.211*** (6.33)	-0.052** (-2.04)	-0.159*** (-5.02)

*Notes:* Table values are the partial derivatives evaluated at the sample mean. t statistics are in parentheses. Results from each equation are used to construct a mode-specific lambda term for use in the three prices of care equations shown in Appendix Table D. (Significance level: \*-10%; \*\*-5%; and \*\*\*1%.)

**Table D. Determinants of the Amount Paid for Each Child Care Mode (OLS Estimation for Each Type of Care with Sample Limited to Those Mothers Who are Employed and Using and Paying for that Mode of Care)**

Variable	Relative n=249	Home- based n=389	Center-based n=839
Constant	-0.493 (-0.95)	-0.394 (-1.09)	-0.906* (-1.82)
Education	0.021* (1.73)	0.035 (1.02)	0.039** (2.54)
Age	0.011** (2.22)	0.041*** (3.60)	0.010* (1.84)
Nonwhite	-0.040 (-0.66)	-0.211* (-1.81)	-0.0971 (-1.45)
Nonlabor Income	6E-5*** (4.59)	9E-5*** (2.73)	4E-5*** (2.71)
Youngest child is an infant	0.063 (0.53)	-0.062 (-0.45)	0.080 (0.62)
Presence of other preschoolers	0.285*** (4.90)	0.124 (1.11)	0.340*** (5.59)
Presence of children ages 6-12	-0.057 (-1.16)	-0.280*** (-2.74)	-0.161*** (-2.72)
Presence of children ages 13-17	-0.133* (-1.78)	-0.136 (0.79)	-0.226** (-2.34)
Presence of other adults	-0.079 (-0.69)	-0.363** (-2.28)	-0.079 (-0.94)
Urban residence	0.174*** (2.94)	0.094 (0.87)	0.179*** (3.33)
Southern residence	0.135 (1.25)	-0.008 (-0.05)	-0.029 (-0.24)
State's regulated child:staff ratio <10:1)	0.093* (1.74)	0.174 (1.58)	0.072 (1.16)
State regulates center teachers education	0.068 (1.19)	-0.092 (0.96)	0.124** (2.28)
State's average Medicaid expenditure per enrollee	4E-5 (1.57)	-9E-5** (-2.05)	2E-5 (0.86)
State's average monthly AFDC payment per family	7E-4*** (2.59)	2E-4 (0.42)	3E-4 (0.91)
Married	-0.043 (-0.52)	-0.260 (-1.53)	0.185** (2.24)
Lambda	-0.283 (-0.86)	-0.795 (-1.54)	0.015 (0.06)
Adjusted R-squared	0.272	0.180	0.218

Notes: Table values are coefficients from the OLS Price equation for each care mode separately. t statistics are in parentheses. Significance level: \* - 10%; \*\* - 5%; \*\*\* - 1%. Results from these equations are used to construct the three predicted prices used in the structural multinomial logit shown in Table 5.

**Table E. Marginal Effects From Reduced Form Ordered Probit on Employment State (n=5764)**

	Not employed	Part-time	Full-time
Constant	3.208***	-0.233***	-2.976**
Education	-0.230***	0.017***	0.213**
Age	-0.204***	0.015***	0.189***
Age-squared	0.003***	-2E-4	-0.003**
Education-squared	0.002	-1E-4	-0.002
Education * Age	0.011***	-8E-4***	-0.010***
Education * Age-squared	-1E-4***	1E-5***	1E-4***
Education-squared * Age	-1E-4	4E-6	5E-5
Nonwhite	-0.004	3E-4	0.004
Unhealthy	0.184***	-0.013***	-0.171**
Nonlabor income	4E-5***	-3E-7***	-4E-5***
# of children	0.102***	-0.007***	-0.094***
# of children ages 0-2	0.094***	-0.007***	-0.087***
# of children ages 3-5	0.069***	-0.005***	-0.064***
# of children ages 13-17	-0.132***	0.010***	0.122***
Presence of other adults	-0.066***	0.005***	0.0625***
Urban residence	0.018	-0.001	-0.016
Southern residence	-0.011	0.001	0.010
Unemployment rate	0.026***	-0.002**	-0.023***
State's regulated child:staff ration <10:1	0.007	-0.001	-0.006
State regulates center teachers education	-0.039**	0.003**	0.036**
State's average Medicaid expenditure per enrollee	2E-5***	-2E-6***	-2E-5***
Employers estimated workers' comp. payment by state	0.001	-1E-4	-0.001
State's average monthly AFDC payment per family	2E-5	-2E-6	-2E-5
Married	-0.065***	0.005**	0.060***

*Notes:* Table values are the marginal effects from an ordered probit evaluated at the sample means. The estimation provides only one set of coefficients so the significance level of the coefficient is indicated by the stars. (Thus the variable is either a significant predictor of employment or not.) t statistics corresponding to the estimated coefficients are in parentheses. Significance level: \* - 10%; \*\* - 5%; \*\*\* - 1%. These results are used to construct the predicted probability of full-time employment which is used as a key regressor in the structural multinomial logit model. See Table 5 for these model results.