The influence of local price and availability on parents' choice of child care

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Abstract. The striking variation in patterns of child care usage across states reflects differences in family characteristics, but may also reflect exogenous differences in local child care markets. Type of care selected will be influenced by the availability, cost, and accessibility of supply in the child care market as well as by family and child characteristics and cultural preferences. This study contributes to the growing literature on parental demand for child care by using a recent detailed data set from the state of Minnesota. We link household-level data on child care usage and family characteristics with county-level data on average provider rates and availability by type of care in order to estimate multinomial logit models analyzing the family, child, and market characteristics that predict type of care. Our analysis shows that using a relative or friend to care for a child is largely determined by availability, and choice of family care providers is most responsive to price for employed mothers. The types of care chosen by mothers who are not in the paid labor force differ substantially from the choices of employed mothers, and their use of center care is influenced by the prices of both center and family providers. Attitudes towards relative care are also shown to influence type of care chosen.

Keywords: child care, employment of mothers, multinomial logit

Introduction

Recent studies reveal striking differences in patterns of child care usage across states. A report by the Urban Institute using data from the 1999 National Survey of America's Families (NSAF) shows wide variation across 12 states in the percent of children in care, the types of care used, and the hours of care. The percentage of children under age 5 in center care ranges from 37% in Alabama to only 10% in Michigan (Sonenstein et al. 2002: 9). Differences in patterns of child care use across states certainly reflect differences in family characteristics (such as income), but may also reflect exogenous differences in local child care markets stemming from differences in zoning

restrictions, the location of employment relative to residence, and average income levels in the neighborhoods where one works and lives. Income levels matter because low-income families in all states typically use less center-based care and rely more frequently on relatives for child care. The type of care chosen by parents will be influenced by the availability, affordability, and accessibility of supply, as well as the parents' employment status, income, age of children, cultural preferences, and so on. Public policy may also impact parents' choices through its effect on the supply and quality of child care, and because mandated child–staff ratios affect the price of different types of child care settings. States also vary widely in the amount of funds they spend on child care, both in funding for child care subsidies to low-income and welfare families, and on quality initiatives (Blau & Tekin 2001; U.S. GAO 2002).

While some parents enroll their children in nonparental care for educational purposes only, for most families, the demand for child care is related to the employment of both parents, and in particular, employment of the mother.[1] Child care services are offered in a number of different kinds of settings that vary in terms of price, number of children and adults, and setting or environment. Parents interested in an educational curriculum and school-like setting for a preschooler may choose a child care center over other options. Some parents may prefer a home-like environment, and so choose a family provider who provides care for children in her own home, or a nanny who provides care in the children's home. Other factors may influence the choice of type of care, including the convenience of in-home care, availability and need for evening or weekend care, the flexibility of the care to accommodate changes in parental work schedules, and the perceived quality of the care.

Previous studies have focused primarily on two issues related to the demand for child care. First, a number of studies have analyzed the impact of child care costs on mothers' labor force participation decisions. Not surprisingly, these studies consistently find that the price of child care is inversely related to mothers' employment decisions, although they differ substantially in the estimated sensitivity of employment to price. The second area of research, the primary focus of this paper, investigates the factors affecting parents' choice of the type of child care. These studies have also found that the price of child care influences choice, but it is just one of many factors parents weigh in deciding what kind of child care to use. Parents frequently

cite quality, safety, convenience, and availability as the reasons for their selection of a particular type of child care setting.[2]

Almost all of the previous published work on child care choice has used nationally representative data sources. While these studies provide a broad understanding of the factors affecting parental choice, they seldom have good information on two key variables, namely child care price and availability. They also abstract from the differences in local behavior such as those reported in Sonenstein et al. (2002). In this paper, we use a different approach. Our work is focused on parents' selection among child care choices in one state, Minnesota. By combining county-level market rate and availability data with a data-rich survey of Minnesota parents, we are able to consider parent choices without having to estimate prices or abstract from local availability issues.

Given the link between women's employment and child care demand, a challenge for research on child care choices is to account for this relationship. In the past, most researchers simply limited their analyses to employed mothers.[3] Yet 24% of nonemployed mothers in our sample report using nonparental child care for more than 5 h a week. Their choices are important for understanding children's school readiness and the availability of child care arrangements for the children of employed mothers. Thus, in this paper, we estimate multinomial logit models of the choice of type of child care for both employed and nonemployed mothers using two different strategies to account for the joint employment-child care decision.[4] The first strategy separates the analysis between employed and nonemployed mothers. This approach yields results comparable with other studies that have focused on employed women only, and allows us to compare the choices of employed vs. nonemployed mothers. The disadvantage of this approach is that it assumes that the mother's decision to be employed is separate from the child care choice. The second approach uses an estimated propensity to be employed as a predictor of child care choice in addition to the other variables of interest. The disadvantage of this approach is that it confines the effects of the other variables to be the same for employed and nonemployed mothers.

We find evidence that while child care choices differ for nonemployed and employed mothers, analyzing the choices made by nonemployed mothers helps to distinguish among the modes of child care and the multiple dimensions affecting parents' decisions. For example, nonemployed mothers rarely use family child care, suggesting that its role is primarily one of employment facilitation among mothers who

are in the labor force. Nonemployed mothers may choose center care and preschools, if they use any child care, for the perceived social and educational benefits. Employed mothers, on the other hand, must weigh trade-offs among price, convenience, and school-like environment in choosing care for their youngest children.

Literature review

Numerous studies have examined the relationship between child care costs and employment of mothers. Blau (2001) and Anderson and Levine (1999) summarize a number of studies that have estimated the effect of price of child care on labor force participation (see also Averett et al. 1997; Blau & Robins 1988; Blau & Hagy 1998; Connelly 1992; Connelly & Kimmel 2003; Kimmel 1995, 1998; Ribar 1992, 1995; Powell 1997, among others). These studies have each found that child care costs have a significant negative impact on mother's labor supply, but the range of elasticity estimates is fairly wide.

A separate set of studies have analyzed the factors affecting parents' choice of type of care. Studies such as Lehrer (1983, 1989), Hofferth and Wissoker (1992), Chaplin et al. (1996), Johansen et al. (1996), Hofferth et al. (1996), and Connelly and Kimmel (2003) analyze the impact of price, characteristics of the provider, and characteristics of the family on the choice of type of care, assuming that the employment decision is exogenous. Connelly and Kimmel (2003) model the joint decision between type of care and full-time vs. part-time employment of mothers, including the probability of full-time employment as a regressor; however, their sample is limited to employed mothers only. Hofferth and Wissoker (1992), Chaplin et al. (1996), and Johansen et al. (1996) also confine their analyses to employed mothers only.

Hotz and Kilburn (1992) argued that while nonemployed mothers' use of child care should not be ignored, we also should not expect them to behave like employed mothers. Their results suggest that nonemployed mothers are more price-sensitive than employed mothers. Still, Hotz and Kilburn treat employment as exogenous.

More recently, Blau and Hagy (1998) and Powell (2002) utilized strategies to account for the endogeneity of mother's employment and child care mode choice. Powell (2002) estimated the effects of wages and child care prices on joint employment-type of child care choice using mixed logit and universal logit models. Blau and Hagy (1998) similarly used 14 combinations of employment, child care mode, and

paying for care. Generally, these studies found that both economic factors (income, cost, availability of subsidies) and characteristics of care (location, hours, developmental characteristics) affected families' choices.

The disadvantage of the Blau and Hagy strategy is that the number of categories and the complexity of the estimation procedure require a substantial sample size. Our data set of about 900 is too small for such a model. Yet we believe these data are worth analyzing, given the rich information about price and child care availability that are available at the county level, and because of growing interest in regional differences in child care demand.

The disadvantage of Powell's approach is that the logit model she used does not account for possible correlations among the disturbances in her model's five state-specific utility functions. Such correlation seems likely among the four work/child care mode states. In this paper, we model the employment function as separate from the child care mode choice. In the first of our models we ignore the potential correlation between these decisions, much as Hotz and Kilburn did. In the second of our models, we allow for a correlated error structure and proceed with a two-step approach in which the predicted propensity to be employed is used as a regressor in the choice of child care mode equation.

Two studies directly address the issue of availability of different modes of care. Hofferth et al. (1996) included distance to the nearest child care center and to the nearest family provider as measures of availability of alternative types of care in a model of child care mode choice. Gordon and Chase-Lansdale (2001) found that greater availability of center care increased the probability of mothers' employment and use of center care. They also found considerable variability in the availability of types of child care in communities across the U.S., suggesting the importance of including some measure of options available in models of child care choice.

Empirical model of child care choice

This paper uses a multinomial logit model to analyze the impact of price and availability on the choice of four distinct types of child care. The reference category is none, that is, no nonparental care or only informal care, such as care by nannies, babysitters, or neighbors.[5] The alternative choices include (1) care in a child care center

(or preschool), (2) care by a family child care provider (including both licensed and nonlicensed providers), and (3) care by a relative of the child.

The multinomial logit model is commonly used to analyze the choice made by an individual from a set of J alternatives. The mother will choose child care alternative j if the utility from this choice exceeds the utility from every other alternative. The probability that she chooses j is

$$P_{ij} = \Pr(V_{ij} > V_{ik}) = \frac{\exp(X_i B_j)}{\sum_{k=1}^{J} \exp(X_i B_k)} \text{ for each alternative choice } j \text{ not equal to } k.$$

The vector X_i includes observed characteristics of the mother related to her demand for leisure and the alternative modes of care. These variables include, for example, the mother's education, age, marital status, and attitudes toward relative care, as well as family characteristics such as the age of the youngest child, number of young children, and so on. We also include county-level variables for each individual, measuring the price and availability of alternative modes of child care. The variables and data are described in detail below.

One important limitation of the multinomial logit model is that it assumes that the error terms are independent across alternatives for an individual, also called the independence of irrelevant alternatives (IIA) property. In cases where the alternatives are similar, the IIA assumption may not hold and a nested logit model may be more appropriate. In this paper, we assume that the IIA assumption holds, and indeed, the choices of type of child care differ in a number of ways that suggest that this may be a reasonable assumption.

Theoretical models of women's labor force participation predict that employment and child care choices will be made jointly (for example, Blau 2001; Blau & Hagy 1998; Connelly 1992; Joesch & Hiedemann 2002; Ribar 1995). For most parents in today's economy, it is simply not possible to care for children while working in the paid labor force. The employment-child care decisions of parents reflect options related both to employment and to the type of nonparental child care chosen. To account empirically for the relationship between employment and child care decisions, we examine the choice of child care mode employing two types of econometric models.[6] The first approach assumes that the mother's employment decision is exogenous, and therefore is taken as given. Thus, we estimate multinomial

logit models for the type of child care chosen separately for employed mothers and nonemployed mothers. The second approach views the employment-child care choice as a two-step process. In the first step, we estimate a probit equation for employment, and then use the predicted probability of employment for each mother as a regressor in a multinomial logit model for type of child care. If the employment decision is not exogenous, the second estimation strategy is preferable. However, few studies look at the child care choices of nonemployed mothers, so we provide the separate estimates of the first approach as well.

We expect that being employed will increase the likelihood of choosing any type of care (besides parental or informal), and that the type of care chosen will be influenced by the age of the child, mother's education, and household income. Most studies have found that parents are less likely to enroll infants in center care, although there is some disagreement about whether this is the result of preferences or availability. (See Johansen et al. 1996 and Connelly et al. 2002 for two sides of this debate.) In our analysis we are able to control for availability of center slots and family child care slots by age group so that the availability variable will reflect availability of slots for children of the age of the child. In addition, we include self-reported information on the availability of a relative and separately a friend or neighbor who would care for the child. Having a relative available to care for the child is expected to increase the use of relative care, controlling for all the other factors, just as having a friend or neighbor available is expected to increase the use of informal care. Mother's education and household income have both been shown to increase the probability of using center care, but their effects may be complicated by the effects of these characteristics on employment propensities.

We also expect that the composition of the household will affect parents' choice about the type of care for any one child. Having another child in need of child care is expected to reduce the use of center care and increase the use of relative care (because of lower marginal costs for the second child). School-age children may also affect choices because of the increased pressure on household income and increased complication of transportation. Another adult in the home may reduce the probability of using a center or family child care if the individual is available for child care. Having a child with special needs may also change the choices parents make, although it is difficult to predict *a priori* which mode will be preferred.

A higher price of care in centers is expected to reduce the likelihood of choosing center care; similarly, the price of family child care should be negatively related to the probability of selecting it. Since most relative care is exchanged without money costs, an increase in either the price of center care or the price of family child care would be expected to increase the use of relative care.

Parents' values, beliefs, and culture also may affect the type of child care used. The survey asked a number of questions related to the mother's attitude about child care and the factors she felt were important in selecting care arrangements. We include a set of dummy variables that categorize whether the mother said it was very important, somewhat important, or not important to have a caregiver who is a relative or a family member. We expect that those who stress the importance of a relative caregiver will be more likely to choose relative care or no nonparental care over center or family child care, all else equal. In addition, mothers were asked whether they were using the type of care they preferred for their youngest child, and whether they considered alternative arrangements before selecting the current type. We expect that mothers who considered alternative forms of child care are more likely to choose all types of care over none.

Data and estimation sample

Data sources

The primary data source in this study is a statewide survey of households with children in Minnesota, conducted by the Wilder Research Center (Chase & Shelton 2001). The survey was conducted in 1999 and collected detailed information on both formal and informal child care arrangements used by the family. A random sample of 2450 families with children under age 15 in Minnesota was selected, and the families were interviewed about the types of child care used, number of hours of care per week, and characteristics of the care provided. Information was also collected about family demographic and economic characteristics.

The analysis in this paper focuses on the primary type of child care used for the youngest child in the household.[7] As discussed above, types of care are divided into four categories: (1) child care centers, including preschools, (2) family child care providers (that is, caregivers who provide care for children other than their own, in

the caregivers' home), (3) relatives, whether in their home or in the child's home, and (4) no nonparental care or informal care. The primary or most frequently used arrangement was determined based on the amount of time spent by the child in that arrangement in the last week. Children in nonparental care for less than five hours per week on a regular basis are considered to have no nonparental care arrangements.

Along with the household survey data, we obtained data on the rates charged by child care providers in each county in Minnesota in 1999. These data were collected from providers as a part of the rate survey conducted by the state each year. From the provider rate information we calculated the mean rate for child care for each of three age groups and two provider types in each county in Minnesota in 1999. In estimating the models, the price of care faced by each family is the mean rate for the age group of the youngest child.[8] Further details on the calculation of mean rates are provided in the Appendix.

We also use county-level data on the availability of child care providers in each county. We use the number of child care spaces for each age group, divided by the number of children in that age group, as a measure of local availability of child care. Availability is measured separately for center care and family child care providers.[9] For each family, the appropriate availability measure corresponds to the age group of the youngest child. In addition, the survey asked each mother about the availability of relatives, friends and neighbors to care for her children.

Sample

For this analysis, we focus solely on children who are too young to attend public school, generally those who are under 5 years of age.[10] If there is more than one child in the family below school age, the youngest child in the family is chosen. Because of the design of the survey questionnaire, we use data only from households in which the mother answered the questions; otherwise we would have no information on the mother's employment status.[11] Given the close link between mother's employment and child care decisions, we could not include those households for which we did not know the mother's employment status. Of the original sample of 2450 families, 78% of respondents were female.

Of the 914 mothers of children below school age who were survey respondents, 97% are biological mothers, with the remainder being

Table 1. Descriptive characteristics of mothers and children in the Minnesota Household Survey

Sociodemographic characteristics	Frequency ($N = 914$)	Weighted percentage
Mother is employed, looking for work, holding a job, or in school or training	629	67.4
Mother is working nonstandard hours (before 7 am or after 6 pm, or on weekends), if employed	353	37.4
Mother's education level		
Less than high school degree	30	3.1
High school graduate	181	18.6
Some college or two-year college degree	359	37.7
College graduate (BA, BS) or more	341	40.4
Age of youngest child		
Less than 1 year	175	18.9
1 year old	179	19.7
2 years old	186	20.7
3 years old	144	15.2
4 years old	132	15.3
5 years old	95	10.0
Age missing	3	0.3
Boy	471	51.6
Girl	441	48.3
Gender missing	2	0.2
Youngest child has special needs	117	13.0
Number of children living in the household		
1	283	32.1
2	370	40.3
3	201	21.6
4 or more	60	6.0

Note: Percentages are weighted by sampling weights.

stepmothers, adoptive or foster parents, or the partner of the child's father.[12] Table 1 provides basic descriptive characteristics of the sample. Most of the mothers (67%) were in the paid labor force in the prior week, including those who were looking for work, off work due to illness or vacation, or in school or training programs.[13] Forty

Table 2. Type of child care used by employed mothers

Primary type of child care chosen (percent of children)	Minnesota Household Survey 1999	Comparison: NSAF 1999 Minnesota*
Centers and preschools	19.8	28
Family child care home	34.6	28
Relative	14.4	19
Informal, including activities, babysitters, nannies	6.5	5
None (no nonparental care)	24.6	21

Source: National Survey of America's Families (NSAF), Sonenstein et al. (2002) Table A.1, p. 18.

percent of all the mothers in the sample are college graduates, and nearly as many have some post-secondary education. Most of the remainder are high school graduates. Reflecting Minnesota's population, 88% of the mothers are white. More than half are age 30–39, and 81% are married.

Table 2 shows the selection of type of child care used most often for the youngest child in the previous week by mothers who were in the paid labor force. Among employed mothers, one-quarter did not use a regular nonparental care arrangement.[14] Over one-third of employed mothers used family child care providers, and about 20% used child care centers. These percentages are similar to results for Minnesota obtained from the National Survey of America's Families (NSAF) (Sonenstein et al. 2002), however, we find somewhat less use of center-based care (20 vs. 28%), and more use of family child care homes in Minnesota (35 vs. 28%) than the other survey. Differences in samples and question design may explain the differences in reported use.

Most nonemployed mothers (76%) in Minnesota use no child care arrangements for their youngest child on a regular basis for more than 5 h per week (Table 3). The remaining one-quarter primarily use relatives (9%) and centers and preschools (10%). While few studies look at the child care choices of mothers not in the paid labor force, we can compare these Minnesota patterns to national data from the Survey of Income and Program Participation (Smith 2002). Nationally, 71% of nonemployed mothers used no regular child care, compared to 76% in Minnesota. Nationally, those who did use care overwhelmingly chose relatives (20%) and centers (11%).

Table 3. Type of child care used by nonemployed mothers

Type of child care chosen	Minnesota Household Survey 1999	Comparison: SIPP United States 1997*
Centers and preschools	9.7	11.2
Family child care home	1.4	3.5
Relative	8.7	20.4
Informal, including activities, babysitters, nannies	4.0	2.9
None (no nonparental care)	76.2	70.7

Note: Multiple arrangements are included in these percentages. The report does not identify primary arrangements for mothers who are not employed, however, only 6.5% report multiple arrangements.
Source: Survey of Income and Program Participation, in Smith (2002) Table 2, p. 4.

Most studies of child care choice focus on employed mothers only, yet the child care choices of nonemployed mothers differ considerably from those in the paid labor force. Most striking is the lack of use of family child care providers among nonemployed mothers. As shown in Table 4, only 6% of nonemployed mothers who use regular child care chose family providers, compared to 46% of employed mothers who use child care. A nonemployed mother may be choosing center care for its perceived beneficial educational and social effects on children approaching school age. Family child care, on the other hand, is clearly used primarily by employed mothers.

Table 4. Primary care arrangements for those using regular nonparental care

Type of child care chosen	Frequency (N = 914)	Percentage of those using nonparental care	
		Nonemployed mothers	Employed mothers
Centers and preschools	134	40.8	26.3
Family child care home	243	5.9	45.9
Relative	116	36.6	19.1
Informal, including activities, babysitters, nannies	47	16.8	8.6

Note: Children in care less than 5 h per week are counted in "none". Percentages are weighted by sample weights.

Table 5. Multinomial logit model results for employed mothers (estimated coefficients, marginal effects, and z-statistics)

Type of care:	Center-based care		Family child care		Relative	
Variable	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect
Average price of center care in county	0.423 (0.77)	0.0026	0.726 (1.98)*	0.1414	0.239 (0.41)	−0.0174
Average price of family child care	−0.871 (0.78)	0.0111	−1.734 (2.20)*	−0.3448	−0.602 (0.48)	0.0365
A relative is available	0.460 (1.30)	0.0158	0.055 (0.20)	−0.1182	1.775 (5.73)**	0.2017
A friend or neighbor is available	−1.008 (3.69)**	−0.0646	−0.737 (2.85)**	−0.1004	−0.572 (2.10)*	−0.0082
Availability of center care	−0.0092 (0.40)	−0.0001	−0.012 (0.65)	−0.0016	−0.018 (0.62)	−0.0010
Availability of family care	−0.031 (1.32)	−0.0045	0.012 (0.70)	0.0051	−0.0032 (0.12)	−0.0004
Teenager in household	−0.145 (0.33)	−0.0067	−0.401 (1.51)	−0.1196	0.597 (1.62)	0.0950
Another adult lives in the household	0.455 (1.03)	0.0396	0.168 (0.40)	−0.0161	0.501 (1.15)	0.0353
Youngest child age 1	−0.076 (0.15)	−0.0030	−0.185 (0.54)	−0.0550	0.290 (0.67)	0.0405

Table 5. Continued

Type of care:	Center-based care		Family child care		Relative	
Variable	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect
Youngest child age 2	1.191 (2.28)*	0.1171	0.582 (1.65)+	0.0301	0.435 (0.87)	−0.0080
Youngest child age 3	1.88 (2.23)*	0.2399	0.665 (1.27)	−0.0362	0.531 (0.62)	−0.0211
Youngest child age 4	2.645 (3.27)**	0.3689	0.975 (1.71)+	−0.0730	0.502 (0.55)	−0.0532
Youngest child age 5	3.078 (3.69)**	0.4044	1.32 (2.16)*	−0.0891	1.149 (1.38)	−0.0348
Youngest child has special needs	0.843 (1.59)	0.0851	0.251 (0.66)	−0.0405	0.763 (1.47)	0.0510
Mother's age	−0.011 (0.48)	−0.0012	0.0054 (0.29)	0.0034	−0.030 (1.06)	−0.0029
Mother is currently married	−0.635 (1.35)	−0.0719	−0.096 (0.36)	0.0392	−0.396 (0.88)	−0.0231
Mother has some postsecondary or college	0.459 (1.46)	0.0581	0.042 (0.21)	−0.0148	−0.119 (0.30)	−0.0198
Mother works non standard hours	−0.489 (1.73)+	−0.0428	−0.309 (1.13)	−0.0510	0.138 (0.53)	0.0341

Table 5. Continued

| Type of care: | Center-based care | | Family child care | | Relative | |
Variable	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect
Household income (/1000)	0.0010	0.0001	0.0005	0.0001	0.0002	−0.0001
	(1.92)+		(1.12)		(0.35)	
Number of additional children 0–5 years	−0.317	−0.0322	−0.071	0.0084	−0.133	−0.0045
	(0.92)		(0.30)		(0.53)	
Number of additional children 6 to 12 years	−0.321	−0.0326	−0.143	−0.0224	0.156	0.0261
	(1.47)		(1.08)		(0.73)	
Considered alternatives when selecting care	2.195	0.1697	1.487	0.1476	0.971	−0.0168
	(5.34)**		(4.83)**		(3.00)**	
Considers having relative care somewhat important	0.873	0.0866	0.451	0.0725	−0.433	−0.0727
	(2.18)*		(1.50)		(1.54)	
Considers having relative care not important	1.030	0.0631	1.044	0.2015	−0.530	−0.0982
	(3.22)**		(2.99)**		(1.39)	
Constant	−1.243		0.666		0.150	
	(0.87)		(0.58)		(0.10)	
N = 604, Log-likelihood = −648.36						

Base category is no nonparental care.
Absolute value of z-statistics in parentheses.
+Significant at 10%; *significant at 5%; **significant at 1%.

The price of child care differs by age of child and setting (family provider vs. center), and varies considerably across localities. Appendix (Table A2) provides the mean hourly price of child care by region in Minnesota.[15] Prices of all types of care are considerably higher in the counties in the Twin Cities metropolitan area than elsewhere in Minnesota. Hourly prices in the Twin Cities average $3 to $4 in family child care vs. $5 to $6 in centers for the three age groups. Outside of the Twin Cities of Minneapolis and St. Paul, prices for family child care average closer to $2 per hour in family child care, and between $2 and $3 per hour in centers.

Availability, as measured by the number of spaces per child in each age group, also varies widely across counties. Appendix (Table A3) lists the estimated average number of slots per 100 children available in each region by age of child and type of setting (center or family child care).[16] More than one-quarter of the counties have no child care centers. The average number of spaces in centers and preschools ranges from about three slots per 100 infants to 17 slots per 100 preschoolers. The majority of child care slots are in family child care, however. Across the counties, the mean number of slots in family child care is 25 for each infant or toddler, and 36 for each preschool age child.

Empirical results

Employed mothers only

Table 5 presents the estimated coefficients and marginal effects of a multinomial logit model of choice of type of child care restricted to those mothers who were employed. The results show that the likelihood of choosing center care increases with the age of the youngest child, which may reflect both that some centers will not take very young children and that some parents prefer school-like environments for children approaching school age. The model includes dummy variables for each age group, 1–5 years (with those less than 1-year old as the omitted category), which allows the effects of each additional year of age to be different. The results show that the likelihood of choosing a center increases with ages two, three, four, and five, and grow larger as the child gets older (relative to those less than one year old). Higher household income also increases the probability of using center care (significant at the 10% level). The option of using relative care is contingent on having a relative available willing and able to care for the child. Not surprisingly, therefore, having a relative

available is a strong predictor of using relative care.[17] Similarly, having a friend or neighbor available is associated with a decrease in the likelihood of other modes of care. Finally, we find that mothers who work nonstandard hours (defined as before 7 a.m. or after 6 p.m., or on weekends) appear to be less likely to choose centers, which is not surprising given that most centers are not open during nonstandard work hours.

By linking data on price of care in the county of residence of the mother with the household data, we avoid the problem faced by most previous studies of selection bias that occurs when trying to estimate prices from the family's observed choices.[18] The results in Table 5 show that the estimated marginal effects of price are not statistically significant except for the family child care mode. A higher average price for family child care in the county lowers the probability of choosing a family provider, and a higher center price increases the probability of choosing family child care over none. However, the prices of both center and family care do not have a statistically significant effect on the choice of center care.

The estimated coefficients on the county-level availability measures are not significant, although, as noted above, the availability of a relative or friend has a strong impact on the likelihood of choosing those forms of care. While market availability is not statistically significant in most of the specifications, in a model estimated with only the availability of center and family slots, these two variables have the expected signs and are significant. When all variables other than price are included, these variables are significant for the family and relative choices. When price variables are included, availability appears to affect only relative choice (more center availability reduces the use of relative care). These sensitivity results suggest that market availability does matter, but that price and availability are correlated, as one might expect when the private market provides the marginal child care slot.

The two measures of the mothers' attitudes toward child care and its selection were found to be significant in affecting the choice of type of care. The first, whether the mother considered alternative forms of child care, is positively associated with choosing either center or family child care over none. In addition, those who report that having a relative care for their children is not important (compared to those who say it is very important) are more likely to use center or family care. For those who say that using a relative is somewhat important, the likelihood of using center care (over none) is

somewhat higher. Thus, not surprisingly, people who feel it is very important to have a relative caring for their children are more likely to use no nonparental care or relative care.[19]

Nonemployed mothers

The majority of mothers in this sample were employed in the paid labor force (67%), similar to the percentage for mothers as a whole in Minnesota. The remaining 257 mothers did not report working (or looking for work) in the prior week, and of these, 24% used child care for at least 5 h per week on a regular basis. Despite the fairly small sample size, a number of variables are significant predictors of the choice of child care chosen by these mothers.[20] Table 6 presents the estimated coefficients and marginal effects from a multinomial logit model for choice of type of care for nonemployed mothers. As for employed mothers, the use of center care increases with the age of the child and with income. These results suggest that mothers perceive center care as having beneficial educational and social effects on children approaching school age.

Table 6 also shows results similar to those of Hotz and Kilburn (1992) that nonemployed mothers are sensitive to the price of child care. The use of center care is negatively associated with the average price of a center in a county and positively associated with average price for family child care (both are significant at the 10% level). Higher prices for family child care are associated with less use of family child care. At the same time, increased availability of family child care is negatively associated with the use of relative care (over none). The strength of these results on price and availability, given the small sample size, renews our confidence in the predictive power of these variables *per se* and adds confidence to the importance of the finding of nonsignificance of price and availability for employed mothers.

Attitude variables also matter for nonemployed mothers. Having considered alternative types of care is positively associated with family care (over none), and is positive and not significant for center and relative care. If the mother reports that having a relative care for her children is very important, the likelihood of family care is less, and of relative care is higher (significant at the 10% level).

Sensitivity analysis: Inclusion of informal care arrangements in base vs. family child care

Categorization is an important consideration in multinomial logit models, and the grouping is made more difficult in a study of child

Table 6. Multinomial logit model for nonemployed mothers (estimated coefficients, marginal effects and z-statistics)

Type of care:	Center-based care		Family child care		Relative	
Variable	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect
Average price of center care in county	−2.025 (1.96)+	−0.0326	1.309 (1.41)	0.0044	0.385 (0.38)	0.0178
Average price of family child care	3.718 (1.78)+	0.0602	−4.782 (2.70)**	−0.0160	−0.995 (0.44)	−0.0448
A relative is available	−1.235 (1.59)	−0.0173	−0.457 (0.32)	−0.0015	0.673 (1.48)	0.0336
Availability of center care	0.036 (1.12)	0.0005	0.139 (2.30)*	0.0005	0.034 (0.55)	0.0014
Availability of family care	0.026 (0.85)	0.0005	−0.017 (0.35)	0.0000	−0.120 (3.24)**	−0.0052
Age of youngest child	0.754 (2.96)**	0.0122	−0.777 (1.56)	−0.0026	−0.272 (0.83)	−0.0121
Mother's age	−0.067 (1.37)	−0.0011	0.117 (0.77)	0.0004	0.088 (1.43)	0.0038
Mother has some postsecondary or college	−0.493 (1.29)	−0.0071	−0.664 (0.73)	−0.0020	−0.727 (1.11)	−0.0301

Table 6. Continued

Type of care:	Center-based care		Family child care		Relative	
Variable	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect
Household income (/1000)	0.0022 (2.41)*	0.0000	0.0021 (1.69)+	0.0000	-0.0007 (1.01)	0.0000
Number of additional children 0 to 5 years	-0.070 (0.16)	-0.0007	0.450 (0.73)	0.0016	-0.604 (1.11)	-0.0260
Number of additional children 6 to 12 years	-0.157 (0.53)	-0.0023	-0.301 (0.45)	-0.0010	-0.189 (0.46)	-0.0080
Considered alternatives when selecting care	1.146 (1.25)	0.0246	2.838 (2.09)*	0.0371	1.339 (1.51)	0.0910
Considers having relative care very important	-0.486 (0.82)	-0.0081	-2.623 (3.07)**	-0.0118	0.709 (1.83)+	0.0316
Constant	-6.901 (2.31)*		-0.853 (0.14)		-1.301 (0.45)	

$N = 257$, Log-likelihood $= -119.81$

Base category is no nonparental care.
Absolute value of z statistics in parentheses.
+ Significant at 10%; * significant at 5%; ** significant at 1%.
Note: Fewer variables are included in the model for mothers not in the labor force because the small sample size resulted in empty cells.

care choice because of the profusion of types of care arrangements. In the main results of the paper, we included those mothers who chose "informal" care, that is, care by friends, neighbors, babysitters, and nannies in the category of no nonparental care. As a reviewer pointed out, some of these arrangements may be very similar to family child care homes. (despite the fact that in the survey, parents responding that care was provided in a family child care home were included in a separate category.) In order to test whether the grouping of informal care with no nonparental care alters the results, we re-estimated the models including the informal category with the family child care providers (instead of with no nonparental care). Note that to be included as having any nonparental care for the study, the child must have been in a regular arrangement for at least 5 h in the previous week. Children in arrangements that are not "regular", or that cover less than 5 h in a week, are included in the no nonparental care category.

Comparing the new estimates for the regrouping with the results reported in Table 7, we find that the estimated coefficients and significance levels are qualitatively unchanged, with two exceptions. First, the variable indicating availability of a friend or neighbor is, not surprisingly, a strong predictor of use of this type of care. As a result, in Table 7, where informal care is included with no nonparental care, the availability of a friend or neighbor is negatively associated with the use of family child care for employed mothers. When we move the informal care into the family provider category, the estimated coefficient on availability of friend or neighbor shrinks dramatically to −0.022 (from −0.737) and is no longer statistically significant.

The other change when we include informal arrangements with family child care occurs in the specification estimated for nonemployed mothers. The estimated coefficient on the price of family child care is negative and statistically significant at 5% level in all specifications, but increases in absolute value when informal care is included with family child care (from −4.78 to −5.62). With these exceptions, combining informal care with family care vs. with no nonparental care does not appreciably change the results. Ideally we would like to have included informal care as a separate mode altogether, but the number of mothers using informal care on a regular basis in this sample is quite small – only 47 women are included in the informal category.[21] A larger sample and additional survey questions would be helpful for a more complete investigation into the reasons some mothers choose informal care over more formal child care arrangements.

Table 7. Multinomial logit model for full sample of mothers including predicted employment (estimated coefficients, marginal effects and z-statistics)

Type of care:	Center-based care		Family child care		Relative	
	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect	Estimated coefficient (z-statistic)	Estimated marginal effect
Predicted employment	0.756 (0.34)	−0.0524	3.133 (2.62)**	0.5421	2.402 (1.58)	0.1217
Average price of center care in county	0.075 (0.17)	−0.0126	0.581 (2.05)*	0.1117	0.132 (0.26)	−0.0056
Average price of family child care	−0.249 (0.27)	0.0244	−1.445 (2.55)*	−0.2777	−0.273 (0.25)	0.0199
A relative is available to care for child	0.089 (0.29)	−0.0118	−0.080 (0.32)	−0.0735	1.521 (6.72)**	0.1790
A friend or neighbor is available	−0.654 (2.36)*	−0.0395	−0.634 (2.58)**	−0.0945	−0.353 (1.48)	−0.0085
Availability of center care	0.011 (0.57)	0.0011	0.0056 (0.36)	0.0011	−0.012 (0.55)	−0.0014
Availability of family child care	−0.018 (1.01)	−0.0021	0.012 (1.01)	0.0035	−0.014 (0.71)	−0.0014
Teenager in household	−0.078 (0.19)	−0.0092	−0.296 (1.21)	−0.0768	0.673 (2.07)*	0.0892
Age of youngest child	0.568 (4.49)**	0.0513	0.134 (0.96)	0.0063	0.097 (0.65)	−0.0015

Youngest child has special needs	0.902	0.1004	0.087	−0.0361	0.541	0.0372
	(2.21)*		(0.32)		(1.40)	
Mother's age	−0.022	−0.0021	0.0034	0.0021	−0.024	−0.0021
	(0.93)		(0.20)		(0.98)	
Mother is currently married	−0.809	−0.0997	0.113	0.0582	−0.210	−0.0108
	(1.43)		(0.35)		(0.45)	
Mother has some postsecondary or college education	0.281	0.0331	−0.045	−0.0121	−0.224	−0.0222
	(1.16)		(0.29)		(0.80)	
Household income (/1000)	0.0013	0.0001	0.0004	0.0001	0.0003	−0.0001
	(2.78)**		(0.99)		(0.77)	
Number of additional children 0 to 5 years	−0.341	−0.0380	0.123	0.0359	−0.0017	0.0002
	(1.04)		(0.67)		(0.01)	
Number of additional children 6 to 12 years	−0.205	−0.0216	−0.044	−0.0089	0.220	0.0240
	(0.96)		(0.31)		(1.14)	
Considered alternatives when selecting care	2.296	0.1710	1.86	0.2384	1.167	0.0057
	(6.82)**		(6.46)**		(3.59)**	
Considers having relative care somewhat important	0.953	0.0717	0.846	0.1465	−0.212	−0.0539
	(2.77)**		(3.52)**		(0.88)	
Considers having relative care not important	1.016	0.0521	1.41	0.2801	−0.511	−0.0871
	(3.31)**		(5.03)**		(1.44)	
Constant	−2.984		−3.179		−2.339	
	(1.29)		(2.30)*		(1.13)	

$N = 861$, Log-likelihood $= −858.73$

Base category is no nonparental care.
Absolute value of z statistics in parentheses.
*Significant at 5%; **significant at 1%.

Full sample with predicted probability of labor force participation

Using the entire sample of 914 mothers, we first estimate a reduced form equation for the probability that the mother is in the paid labor force in the prior week. Control variables for labor force participation include mother's education; age; marital status; number of children in three age categories, under age 2, aged 3–5, and aged 6–12; whether her youngest child has special needs; and household income. We also include control variables for the age of the youngest child, availability of child care, price of care, and regional dummies. The estimated coefficients are shown in Appendix (Table A4). Based on these estimates, we calculate a predicted probability of labor force participation for each mother in the sample, which is included in the multinomial logit model discussed below. Marital status is a strong predictor of employment – mothers who are married are significantly less likely to be in the labor force than those who are not currently married. In addition, having more children, and especially more young children, reduces the likelihood of employment, as does a younger age of the youngest child.

Table 7 presents the estimated coefficients and marginal effects of a multinomial logit model for type of child care, using the full sample of mothers and predicted probability of labor force participation as one of the regressors. Predicted employment is positively and significantly associated with use of family care (over none), but not center care. Thus, those women most likely to be employed are also most likely to choose family care. This result suggests that family child care is particularly geared to facilitating employment. Center care, on the other hand, is used by nonemployed mothers as well as those who are employed in the paid labor force.

Table 7 also shows that the probability of choosing center care over none significantly increases with the age of the child, special needs of the child, and household income after controlling for the employment effects. Price matters in the choice of family care, both the price of family care and the price of center care. Availability of a friend or neighbor and relatives also matters. Having a friend or neighbor available to care for children has a negative impact on choosing center or family care, and having a relative available increases use of relative care. As with the previous models, having considered alternatives is positively associated with use of all types of care over none. Viewing relative care as only somewhat or not important is positively associated with center or family care. Thus, we find

that most of our conclusions from the "employment is exogenous" model are maintained with this model, which used a two-stage approach to account for the endogeneity of the employment decision to child care choice.

Conclusion

Recent studies have shown that the price of child care influences parent choice of type of care, but it is just one of many factors parents weigh in deciding what kind of child care to use. Parents frequently cite quality, safety, convenience, and availability as reasons for their selection of a particular type of child care setting. Given that patterns of child care use vary widely across states, exogenous differences in local child care markets caused, for example, by state regulations or the location of employment relative to residence may impact parents' choices as well. Using both a detailed survey from Minnesota on family child care use and county level market rate and availability data, we are able to analyze parent choices without having to estimate prices or having to ignore availability.

The child care choices of employed mothers differ from those of mothers not in the paid labor force, and as a result, most studies of child care choice have limited their samples to employed mothers. By analyzing the child care choices of nonemployed mothers in this study, we are able to distinguish some of the multiple dimensions of child care types that affect parents' decisions. The results suggest that certain factors influence the choice of child care mode for both employed and nonemployed mothers. In particular, the age of the youngest child is an important determinant of type of child care, regardless of the mother's labor force status. The likelihood of choosing center care increases with the age of the child, which may reflect both that some centers will not take very young children and that some parents prefer school-like environments for children approaching school age. Also, views on relative care and on alternatives considered influence child care choice in expected ways, highlighting the importance of differences in mothers' preferences and options available in explaining different patterns of use of child care. In contrast, however, family child care is almost exclusively chosen by mothers who are in the labor force, suggesting that its role is primarily one of facilitating employment. For employed mothers using child care, the prices of family

child care and centers influence the use of family child care, but not the use of center care. Thus, family child care is used by employed mothers when the price is right. One can conjecture that for employed mothers, use of center care is less sensitive to price changes because it is both educational and employment-facilitating. Nonemployed mothers' choice of center care is sensitive to the price of center care and family child care. Further evidence that centers play a different role than other child care arrangements was presented in Table 7. There we found that predicted employment was positively and significantly associated with the use of family care (over none) but not center care.

One advantage of this data set is the detailed information on availability of types of care. However, for the most part, the measures of availability of centers and family child care were not statistically significant predictors of the type of care used. This may be a result of the sample size, or a result of the fact that availability measured at the county level is not a close enough proxy for availability at the family level (e.g., we do not have a measure of distance to the closest center or family provider). For nonemployed mothers, the smaller sample size meant that we could not include the variable "friend available" for lack of variation. Still, the availability of family child care did reduce the probability of using relative care for nonemployed mothers. Also, the availability of relatives and friends was a strong predictor of behavior for both employed and nonemployed women. Having relatives available made it more likely that employed mothers used relative care and the availability of friends or neighbors reduced both center and relative care.

Taken together, the results suggest that parents weigh a number of factors in considering child care choices, with price being only one determinant. Nonemployed mothers seem to choose center care and preschools, if they use any child care, for the perceived social and educational benefits for children approaching school age. Center care is correlated with higher income and older ages of the child. Nonemployed mothers are sensitive to the price of center and family care, however. Employed mothers, on the other hand, must weigh trade-offs among price and convenience in terms of facilitating employment and school-like environment in choosing care for their youngest children.

Understanding the criteria parents use in choosing child care options is important to policy makers interested either in increasing the school readiness of young children or in increasing employment of low-income mothers. Factors such as hours open, flexibility of the

child care arrangement, the ability to deal with special needs children, and the educational component of early childhood education are all characteristics of child care that parents take into consideration in addition to price and availability. Both employed and nonemployed mothers seem to recognize the importance of center-based care for older children. In addition, center care is clearly a normal good in our analysis. However, even when center care is available, employed mothers may choose family child care because it offers more flexibility or lower prices. As a result, investing government funds in center care will not necessarily improve school readiness of children if centers cannot also accommodate the employment-based needs of parents. A complementary program might aim to increase the educational component of family child care programs.

Acknowledgments

Notes

1. Alternative arrangements are possible, such as shift work that allows for both parents to be employed without requiring nonparental care. The number of "stay-at-home dads," while rising, is still a very small percentage of all families.
2. Studies vary in their categorizations of types of care. Typical categories include: (1) center care, including preschools; (2) family child care (a caregiver who takes care of children other than her own in her house; (3) relative care; and (4) baby-sitters or nannies, who care for the child in the child's home, and in some studies, simply paid vs. unpaid care.
3. In many surveys, information on child care use is collected only for employed mothers.
4. We restrict our analysis to women because of limitations of the data. Evidence suggests that women continue to make most of the employment-related sacrifices demanded by childrearing, and continue to have primary responsibility for arranging the nonparental care for their children.
5. We also estimated models separating informal care from no nonparental care, however, very few families in the survey used informal care as the primary arrangement for their youngest children. Other studies, including Blau and Hagy (1998), combine relative care with informal care. However, Joesch and Hiede-mann (2002) argue that relative care is perceived by parents as fundamentally different from nonrelative care. Thus, our preferred typology is to combine informal care with no care.

6. We also considered a third approach, combining the employment-child care choice into joint categories, similar to Powell (2002). We estimated a multinomial logit with six categories: not working; employed and using center care; employed and using family care; employed and using relative care; employed and using informal care; and employed and using no child care. The variables that were significant predictors in this model tend to be the ones affecting employment, not child care mode *per se*. In other words, we predicted labor force participation well with this model, but the results were not very informative *vis-à-vis* the choice of type of child care used.

7. This is in keeping with most previous analyses of child care mode choice.

8. We also estimated models using the average price across age groups and found that the price variables were generally not significant. This suggests that using prices that correspond to the relevant age group is preferable, if the data are available.

9. Details on the availability data are found in the Appendix.

10. We included all children age four and younger in the sample, and all children age 5 who were not attending school, according to their parents. Students must be 5-years old prior to a certain date in order to enter kindergarten. A separate analysis would be needed for child care choices for school-age children.

11. The interviewer asked to speak to the person in the household who was most knowledgeable about the children in the household. Employment information was collected only about this individual. Of the 515 male respondents to the survey, 87% had spouses or partners in the household (whose employment status is unknown). The remaining 65 "single dads" are not a large enough group to analyze.

12. A small number (29) of the female respondents were grandmothers or other relatives such as siblings or aunts. These women are excluded from the analysis.

13. In this paper "employed" mothers include those in paid employment or who are looking for work, have a job but are off work due to illness or vacation, and in school or in a training program. "Nonemployed" mothers are those not in the paid labor force or these other categories.

14. In our typology of care types, care by the father is included as "none," no non-parental care.

15. In our multivariate model we use average price at the county level, however, this descriptive table shows regional averages rather than listing all 87 counties. The county data are available from the authors upon request.

16. The model includes county-level data but the table shows regional averages.

17. Because mothers who use relatives to care for their youngest children may be more likely to report having a relative available, we tested a model using the length of time at the current home address as a proxy for availability of friends or relatives. The length of time at current address was not significant, but the other results did not change appreciably.

18. As Moulton and others have shown, ignoring the possibility that error terms are correlated within groups may lead to incorrect estimates of the standard errors of the effects of aggregate-level variables on individual outcomes (Moulton 1990, Wooldridge 2002). In this case we are interested in the effects of two county-level variables, price and availability, on the individual choice of type of care. Thus, variance-covariance matrices are estimated using the 'cluster' option provided with various estimation procedures in the Stata® statistical software package (Stata Press 2001).

19. We estimated a model excluding these attitude variables and found no marked difference in the other estimated marginal effects.
20. Given the small sample size, a number of control variables included in the model for employed mothers could not be included in the analysis for mothers not in the paid labor force.
21. We did also estimate a multinomial logit model with informal care as a separate category, and the results are not substantially different. We prefer the specification with only four categories of care, however, because there are so few informal arrangements in the sample and a large number of variables in the model.

Appendix A

Data on prices charged by child care providers were obtained from the state rate survey in 2000, covering basically the same time period as the household survey. The rate survey data are collected for use in the calculation of maximum reimbursement payments for the state

Table A1. Means of variables

Variable	Nonemployed mothers	Employed mothers
Mother's education		
Not a high school graduate	0.049	0.025
High school graduate	0.179	0.207
Some postsecondary education or college graduate	0.428	0.348
Mother's age	31.9	31.6
Mother's marital status (1 = currently married)	0.909	0.765
Age of youngest child (1–5 years)	1.908	2.302
Youngest child has special needs	0.109	0.137
Teenager in household	0.119	0.138
Household income	57319	49773
Number of additional children 0–5 years	0.554	0.313
Number of additional children 6–12 years	0.677	0.571
Is a relative available to care for child?	0.330	0.328
Is a friend or neighbor available to care for child?	0.249	0.253
Availability of center care (slots per 100 children)	9.6	9.4
Availability of family care (slots per 100 children)	23.0	25.4
Average price of center care in county	4.22	3.77
Average price of family child care in county	2.89	2.68
Number of observations	285	629

Table A2. Average hourly price of child care in Minnesota, by age and type of care

Region	Family/ infants	Centers/ infants	Family/ toddlers	Centers/ toddlers	Family/ preschoolers	Centers/ preschoolers
1	1.79	2.47	1.75	2.14	1.75	2.02
2	2.06	2.65	2.00	2.48	1.99	2.41
3	2.19	2.91	2.08	2.66	2.07	2.40
4	1.93	2.57	1.87	2.19	1.85	2.11
5	1.99	2.23	1.96	2.15	1.94	2.02
6E	1.99	2.87	1.90	2.53	1.88	2.40
6W	1.81	2.17	1.78	1.92	1.77	1.85
7E	2.24	3.08	2.12	2.68	2.07	2.39
7W	2.27	3.44	2.16	2.98	2.11	2.76
8	1.89	2.30	1.85	2.05	1.85	1.93
9	2.02	2.42	1.99	2.35	1.97	2.26
10	2.36	3.29	2.28	2.94	2.23	2.70
11 (Twin Cities metro)	3.75	6.53	3.50	5.38	3.35	4.73

Source: Authors' calculations based on 2000 Minnesota Rate Survey data.

child care assistance program. For each age group (infants, toddlers, and preschoolers), we calculated the mean rate charged by family providers and by centers for each county in Minnesota. In a few counties with few or no centers reporting rates, we used the mean rate charged in the region. The mean rates by region are shown below (Table A2); the county data are available upon request from the authors.

The rate survey asks providers to report their rates in the form they typically use, and so some report an hourly rate, others report a weekly rate (or a daily rate), and some report both. In order to use as many observations as possible, we had to convert to a common format (in this case, hourly rate). However, the conversion rate is not generally agreed upon or known. We analyzed the relationship between weekly and hourly rates for those reporting both, and found wide variations in the conversion rate across providers that did not seem to reflect differences in type of care or location. There was a noticeable difference between rates in the Twin Cities metro area and the rest of the state. Child care prices are considerably higher on average in the Twin Cities, and the conversion rate was consistently lower (which translates to a higher hourly price). Thus we use a conversion rate of 30 for providers in the Twin Cities (Region 11), and

Table A3. Average number of slots per 100 children in Minnesota, by age and type of care

Region	Centers/ infants	Centers/ toddlers	Centers/ preschoolers	Family/ infants & toddlers	Family/ preschoolers
1	1.8	7.0	9.4	35.4	40.5
2	2.3	10.2	9.0	22.6	34.5
3	1.6	5.3	19.7	16.4	29.7
4	1.5	6.6	16.7	30.6	37.6
5	2.3	7.8	8.9	20.3	39.4
6E	2.2	8.8	16.0	25.2	40.0
6W	1.5	4.1	12.9	35.9	49.4
7E	3.0	12.0	17.6	15.3	20.8
7W	3.6	12.5	15.1	20.0	29.4
8	2.3	7.2	27.2	28.0	47.1
9	2.6	9.8	18.3	26.7	42.2
10	2.0	7.9	19.7	24.0	32.8
11 (Twin Cities metro)	4.7	19.1	30.5	18.6	21.3

Source: Authors' calculations based on 2000 Minnesota Rate Survey data and Census 2000 population data. Family child care slots are calculated by multiplying the average

40 for all other providers, reflecting the different conversion rate found in the reported data.

Family child care rates

Most family child care providers report an hourly rate, some report a weekly rate only, and some report both. If an hourly rate was reported, we used that rate. If not, we converted the weekly rate by dividing by 30 for Region 11 providers (Twin Cities metro area) and by 40 for all other providers.

Centers

Most child care centers report a weekly rate, and some, especially in nonmetro areas, report an hourly rate or both. If a weekly rate was reported, we used that rate and converted it to an hourly rate by the same conversion factors as above: 30 for metro and 40 for nonmetro.

Table A4. Estimated reduced form probit model of employment

Variable	Estimated Coefficient	Robust Standard Error	z-statistic	p-Value
Mother is a high school graduate	−0.087	0.136	−0.640	0.525
Mother has some postsecondary or college	−0.098	0.102	−0.960	0.338
Mother's age	0.009	0.008	1.090	0.276
Mother is currently married	−0.752**	0.182	-4.120	0.000
Youngest child is one year old	0.386**	0.134	2.880	0.004
Youngest child is two	0.861**	0.201	4.290	0.000
Youngest child is three	0.636**	0.242	2.630	0.008
Youngest child is four	0.712**	0.274	2.600	0.009
Youngest child is five	0.718**	0.266	2.700	0.007
Youngest child has special needs	0.168	0.140	1.200	0.229
Another child has special needs	0.070	0.162	0.430	0.665
Household income	7.270E−07	1.730E−06	0.420	0.674
Number of additional children aged 0–2	−0.371*	0.153	−2.430	0.015
Number of additional children aged 3–5	−0.436**	0.130	−3.350	0.001
Number of additional children aged 6–12	−0.200*	0.088	−2.270	0.023
A relative is available for child care	−0.013	0.102	−0.120	0.901
A friend is available for child care	0.075	0.100	0.760	0.449
Availability of center care	−0.021*	0.009	−2.220	0.026
Availability of family care	0.001	0.005	0.220	0.824
Average price of center care in county	0.036	0.174	0.210	0.837
Average price of family care in county	0.248	0.320	0.780	0.438
Constant	0.681	0.485	1.400	0.160
Number of observations = 861				
Log likelihood = −468.31				

Note: We define employment broadly to include being in the paid labor force (employed or looking for work), or in school or training.

If a weekly rate was not given, the hourly rate was used. Part-day preschool prices were not included in the average calculation. The hourly–weekly conversion rates for preschools were very different than for centers, although hourly prices were not too different. The

averages were not weighted by capacity (although weighting by capacity made little difference in the means).

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