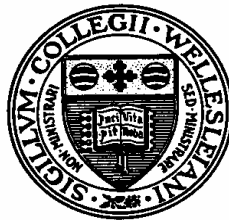


**An Examination of the Child Care Choices of Low-Incomes Families  
Receiving Child Care Subsidies**

Ann Dryden Witte, Ph.D.  
Magaly Queralt, Ph.D.

with the assistance of  
Heather Long

*Wellesley College*



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Wellesley College  
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And  
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## **An Examination of the Child Care Choices of Low-Incomes Families Receiving Child Care Subsidies**

### Executive Summary

In this paper, we study the child care choices of Rhode Island (RI) families receiving child care subsidies. We organize our inquiry around four major questions: (1) What were the impacts of RI's extensive policy and administrative changes to the child care subsidy program on child care choices made by subsidized households? (2) How do household characteristics affect the child care choices of families with child care subsidies? (3) What impact do community characteristics have on child care choices? and (4) Do households with two children in subsidized care and with three children in subsidized care behave differently than households with only one child receiving child care subsidies?

To address these questions, we developed econometric models of child care choice for families with one subsidized child, with two subsidized children and with three subsidized children (see Figures 1-3 and pp. 20-27 of the full report for descriptions of the models). We estimated these models using a monthly longitudinal database containing information on all RI families receiving child care subsidies for the period July 1998 through June 2002. The longitudinal database contains: (1) RI Department of Human Services (DHS) administrative data for the child care subsidy program, (2) information on the availability of Head Start in each RI township, (3) information on Kindergarten programs for all townships in RI, (4) information on the accessibility, availability and stability of formal child care in all RI townships, (6) monthly information on employment growth for all townships and (7) Census 2000 data for all RI townships.

In previous work we found that families with child care subsidies not receiving cash assistance behave significantly differently than families currently receiving cash assistance or that have received cash assistance at some time in the past. Consequently, we provide separate analyses for these two groups. We identified all child care subsidy recipients that received cash assistance (RI's cash assistance program is named the Family Independence Program or FIP, for short) by cycling through monthly files for the RI cash assistance program for the period May 1996 through June 2002. Of the 19,386 households that received child care subsidies between July 1998 and June 2002, 13,621 received cash assistance at some time between May 1996 and June 2002. For convenience, in this report we refer to these current and former cash assistance households as "current and former cash recipients." Five thousand seven hundred sixty-five households receiving child care subsidies between July 1998 and June 2002 never received cash assistance between May 1996 and June 2002. For convenience, in this paper we refer to these income-eligible households as "families that never received cash assistance."

We estimate separate multinomial logit models for the child care choices of: (1) Current and former cash recipients with one subsidized child, (2) Families that never received cash with one subsidized child, (3) Current and former cash recipients with two subsidized children, (4) Families that never received cash with two subsidized children, (5) Current and former cash recipients with three subsidized children and (6) Families that never received cash with three subsidized children. Separate models are needed to discern if families with more than one subsidized child behave differently than families with one subsidized child. Different models are also needed because the choice sets for families with different numbers of subsidized children are different and because both

program rules and information sources are different for FIP and families that never received cash.

The explanatory variables in the logit models include socio-demographic variables that describe the household, variables that represent the township availability, accessibility and stability of child/youth care and education (e.g., child care centers, school-age programs, family child care, kindergarten and both regular Head Start and Early Head Start), variables related to employment levels and hours of work in the township, variables from the 2000 Census describing other characteristics of each township and binary variables for all months except the first month of the study, July 1998. See Table 1 for a list of all the explanatory variables in the study. To control for unobservable household-specific attributes, we allow for a separate error variance for each household.

### **Descriptive Findings**

We find that current and former cash recipients receiving child care subsidies in RI are significantly different from families receiving child care subsidies that never received cash. On average, current and former cash recipients (compared to families that never received cash) are significantly more likely to have a high school degree, to be U.S. citizens, to be black, to have younger children, and to reside in Newport, Providence, Central Falls, or Woonsocket. Compared to families that never received cash, current and former cash recipients receiving subsidies are significantly less likely to receive child support payments, to be Hispanic, and to have two working adults in the household. Overall, cash recipients are more likely to choose informal care for their children than families that never received cash.

As RI reformed its child care policies and changed the way it administered the child care subsidy program, we see a marked increase in the probability that both current and former cash recipients and families that never received cash will choose formal care settings rather than informal care for their children.<sup>1</sup> Among current and former cash recipients with one child care subsidy, the proportion choosing family child care increased considerably during the period of our study, from 12% in July 1998 to 19% in June 2002, the proportion choosing center care increased from 72% in July 1998 to 75% in June 2002, and the proportion choosing informal care declined dramatically from 16% in July 1998 to 5% in June 2002. Among families that never received cash with one child care subsidy, the proportion choosing family child care increased substantially from 14% in July 1998 to 24% in June 2002, the proportion choosing center care decreased from 78% in July 1998 to 72% in June 2002, and the proportion choosing informal care was cut in half, from 8% in July 1998 to 4% in June 2002. Trends are similar for families with two child care subsidies and families with three child care subsidies (see Figures 5 through 9 in the full report).

An unexpected but not surprising finding is that families with two or three subsidized children rarely use different types of care for different children. That is, we find that households tend to choose the same type of care for all of their subsidized children (e.g., put all children in center care). Due to this tendency, we combined all child care choices involving different types of care into a single category to which we refer using the term "mixed care."

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<sup>1</sup> The increased use of regulated care in Rhode Island's is particularly impressive because Rhode Island (RI) began the study period with a much higher proportion of subsidized care in regulated settings than the US as a whole. To be more specific in Federal Fiscal Year 1999, 80% of RI children with Child Care and Development Fund (CCDF) subsidies were in regulated settings while only 52% of children receiving CCDF subsidies nationwide were in such settings. See <http://www.acf.hhs.gov/programs/ccb/research/99acf800R/cover.htm> for details.

## Analytic Results

### ***Question 1: What were the impacts of RI's extensive reform of the policies and administrative procedures governing the child care subsidy program on child care choices made by subsidized families?***

Controlling for all of the factors listed in Table 1 of the full report, we find strong evidence that RI's reform of its child care subsidy policies and the administrative changes undertaken during the period of our study significantly increased the odds that both current and former cash recipients and families that never received cash with child care subsidies would choose formal care for their subsidized children. We also find significant declines in the probability of using informal care for both current and former cash recipients and families that never received cash with median characteristics. The significant increase in the odds of choosing formal rather than informal care and the declines in the probability that families with median characteristics receiving child care subsidies would choose informal care occur for families with one subsidized child, with two subsidized children and with three subsidized children.

Both the timing of the large declines in the probability of using child care subsidies to purchase informal care and the timing of significant increase in the odds of using such subsidies to purchase formal care indicate that these declines occurred because: (1) RI expanded both income-eligibility and age-eligibility for child care subsidies in January 1999 and July 1999, (2) RI increased reimbursement rates for formal providers in January 1999, July 1999, January 2000 and January 2002, (3) RI instituted a Comprehensive Child Care Services program in April 2001, (4) RI began more strictly enforcing requirements for informal providers in mid-June 2001 and (5) RI separated eligibility determination for child care subsidies from enrollment with a

provider, and established portable vouchers in mid-June 2001 (see Figures 13 through 21 of the full report).

RI's policy and administrative changes increased the choices available to low-income families. For example as we have shown previously, Rhode Island's substantial increases in reimbursement rates led to substantial expansion in the availability of formal care in poor communities (Witte & Queralt, 2002). These increases in reimbursement rates and administrative simplification for providers also markedly expanded the proportion of formal providers willing to accept children with child care subsidies. By 2001, 87% of Rhode Islands formal providers accepted child care subsidies while a much lower proportion of providers accept such subsidies in most states (e.g., 41% of formal providers in Massachusetts accept child care subsidies). When faced with the broader array of formal care settings that resulted from these policy and administrative changes, Rhode Island's low-income families with child care subsidies, like more economically advantaged families, chose predominantly formal, regulated care settings for their children.

#### *Impacts of the 1999-2000 Eligibility Expansions*

#### *And Reimbursement Rate Increases*

We believe that the evidence that follows and the more detailed information in this report provide compelling support for the contention that the eligibility expansions and reimbursement rate increases undertaken by RI in 1999 and 2000 (particularly the large provider rate increases in January 2000) caused a significant increase in the likelihood that subsidized families would use formal rather than informal care.

The significant increases in the odds of purchasing center care or family child care with child care subsidies begin earlier for current and former cash recipients than



for families that never received cash. The odds that current and former cash recipients with three subsidized children would choose formal care settings rather than informal care increased significantly beginning in January 1999. The odds that current and former cash recipients with one or two subsidized children would choose formal rather than informal care increased significantly beginning in June 1999. The odds that families that never received cash with two subsidized children would choose formal rather than informal care increased significantly beginning in March 2000. And the odds that families that never received cash with one subsidized child would choose formal rather than informal care increased significantly beginning in September 2000. See Figures 14, 15, 16, 17 and 19 of the full report. We believe that the different timing of the impact of the policy and administrative changes for current and former cash recipients and families that never received cash resulted from the fact that these two types of families generally gain information about the child care subsidy program from different sources.

Current cash recipients gain information about the child care subsidy program from their social worker, who is an employee of the RI DHS. RI DHS runs both the cash assistance and the child care subsidy program. Thus, current cash recipients typically learn about changes in child care policies quite rapidly. Accordingly, current cash recipients are likely to have reacted quite rapidly to the increase in reimbursement rates for formal providers and to the expansions of both the income- and age-eligibility for child care subsidies in January 1999 and in July 1999. Former recipients may learn about such changes from friends and neighbors who are current recipients or may be more aware of web sites and other sources of information on child care policy changes.

In contrast, families that never received cash are more likely to gain information about changes in the child care subsidy program from providers. We believe that the

very large increases in RI DHS payments to formal providers (i.e., reimbursement rate increases) that occurred in January 2000 provided the impetus that formal providers needed to actively recruit eligible families that never received cash (i.e., families with incomes below 225% of the Federal Poverty Level) and help these families obtain child care subsidies. These provider recruitment efforts paid off in terms of families that never received cash increasing their use of subsidized formal care beginning in March and in September 2000.

*Impacts of the 2001 CCCSP and Administrative Changes*

We believe that the evidence that follows and the more detailed information contained on pp. 44-60 of the full report provide convincing support for the contention that the April 2001 introduction of RI's Comprehensive Child Care Services Program (CCCSP) and the June 17, 2001 bundle of administrative reforms<sup>2</sup> caused an additional significant increase in the likelihood that subsidized families would use formal rather than informal care. While we can not definitively separate the effect of the CCCSP from the administrative changes, we believe that it was the administrative changes that were mainly responsible for the increased use of formal care. See p. 106 of the full report for a detailed description of the administrative changes.

We find that the odds that RI families with child care subsidies would choose formal rather than informal care increased substantially between academic year (AY) 2000 and AY 2001. We also find that the probability that families with median characteristics would choose informal care decreased substantially between AY 2000 and AY 2001. To be more specific, we find that the odds that current and former cash recipients with one subsidized child would choose center rather than informal care were

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<sup>2</sup> The changes include de-linking family eligibility from enrollment with a specific provider, portable vouchers and a crack-down on informal providers not meeting subsidy standards.

60% higher in September 2001 than in September 2000, and the odds that such a family would choose family child care rather than informal care in September 2001 were more than 2 ½ times the odds in September 2000. For families that never received cash with one subsidized child, the odds of choosing center care rather than informal care were over 75% higher in September 2001 than in September 2000, and the odds of choosing family child care rather than center care were over twice as large in September 2001 than in September 2000.

For current and former cash recipients with two subsidized children, the odds of choosing center care rather than informal care were almost 50% higher in September 2001 than in September 2000, and the odds of choosing family child care rather than informal care were 77% larger in September 2001 than in September 2000. For families that never received cash with two subsidized children, the odds of choosing center care rather than informal care were 32% higher in September 2001 than in September 2000 and the odds of choosing family child care rather than informal care in September 2001 were almost double the odds in September 2000.

For current and former cash recipients with three subsidized children, the odds of choosing center care rather than informal care were almost 32% higher in September 2001 than in September 2000, and the odds of choosing family child care rather than informal care in September 2001 were almost double the odds of choosing family child care in September 2000. For families that never received cash with three subsidized children, the odds of choosing center care rather than informal care were 33% higher in September 2001 than in September 2000, and the odds of choosing family child care rather than informal care in September 2001 were almost double the odds in September 2000.

***Question 2: How do household characteristics affect the child care choices of families with child care subsidies?***

We find that the age of the head of household, the age of the children receiving child care subsidies, the percent of children of various ages, race/ethnicity, citizenship status and education all have significant effects on the child care choices of households with child care subsidies. We find the strongest and most consistently significant results for variables related to the age of the household head and the ages of the subsidized children.

*Age of the Head of Household*

We find that the age of the head of household significantly impacts the child care choices of current and former cash recipients with one, two and three subsidized children. But the age of the household head has limited impact on the choices of families that never received cash. To be more specific, for example, we find that the likelihood that typical current and former cash recipients with one or with two subsidized children would choose center care (rather than informal care) increases until the household head is in her early to mid 30s, and it declines thereafter. In contrast, the likelihood that typical current and former cash recipients with one or with two subsidized children would choose family child care (rather than informal care) increases linearly as the household head becomes older. These impacts of the head of households' age on the type of care chosen may be due to such things as cohort effects (older age cohorts prefer family child care) or changes in the type of care desired with increasing experience with different types of care. We find no significant impact for citizenship status on the odds that families with child care subsidies will use center relative to informal care.

### *Ages of the Subsidized Children*

We find that the ages of the youngest and oldest children with subsidies have specific and significant impacts on the child care choices of current and former cash recipients and families that never received cash with one, two or three child care subsidies. One theme that emerges from our analysis is that, for both current and former cash recipients and families that never received cash, as the youngest and oldest subsidized children become older, the family becomes significantly less likely to choose family child care or different types of care for different children.

### *Impact of Having One or More Infants in Subsidized Care*

Current and former cash recipients and families that never received cash with a subsidized infant and no other subsidized children are significantly more likely to use informal care than center or family child care. However, current and former cash recipients with three child care subsidies are significantly more likely to choose family child care for all three children, rather than informal care, if at least one of the subsidized children is an infant.

### *Impact of Racial-Ethnic Background*

In general we find that race/ethnicity has more impact on the child care choices of current and former cash recipients than of families that never received cash. The impact of race/ethnicity on the choices of families that never received cash seems limited to families with only one child care subsidy. We find that Hispanic current and former cash recipients with one, two or three child care subsidies are significantly more likely to choose informal care than center care. But Hispanic families that never received cash are not significantly more likely to choose informal care than center care. Our results indicate that Black current and former cash recipients with one child in

subsidized care are significantly more likely to choose informal care rather than family child care, and we find that Black families that never received cash with one subsidy are significantly more likely to choose center care than informal care.

#### *Impact of Parent's Education*

We find no significant effects of head of household's education on the child care choices of current and former cash recipients with one child care subsidy. But for families that never received cash with one subsidy, we find that having a household head with a high school education increases the odds of choosing family child care rather than informal care. In contrast, for current and former cash recipients with two or three child care subsidies, we find a significant and positive relationship between the level of education of the head of household and choice of center care or different types of care rather than informal care for the children. However, we find that level of education has no significant effects on the child care choices of families that never received cash with two or three subsidized children.

#### *Impact of U.S. Citizenship*

Current and former cash recipients that are headed by a non-citizen (as compared to current and former cash recipients headed by a U.S. citizen) are significantly more likely to choose family child care rather than informal care. This is true for current and former cash recipients with one, two or three child care subsidies. We find similar but lesser impact of citizenship status on the choices of families that never received cash. Specifically, only those families that never received cash headed by a non-citizen and with two child care subsidies are significantly more likely to choose family child care rather than informal care for both children. The strong preference of non-citizen's for family rather than informal care may reflect the fact that as recent

immigrants that have no informal care available. Given a choice between center care and family care, such families generally choose family care possibly because of their greater familiarity with such care settings.

Citizenship status only has a significant impact on the choice of center care relative to informal care for current and former cash recipients with three child care subsidized. Such current and former cash recipients that are not US citizens are significantly more likely to choose center care (relative to informal care) than are families that are US citizens.

***Question 3: What impact do community characteristics have on child care choices?***

*Impact of Availability of Care and Education*

Our work on the impacts of the availability of formal care and education on child care choices should only be considered suggestive. The reason is that in order to obtain good (i.e. unbiased) parameter estimates for the other variables in the model, we held the availability of care and education at the 1998 level. Even with this considerable limitation, we find that increased availability of center care for preschoolers significantly increases the probability that households with child care subsidies will purchase center care. We also find that greater availability of Head Start significantly increases the probability that current and former cash recipients will choose center care for their subsidized children. Similarly, we find that increased availability of kindergarten increases the likelihood that both current and former cash recipients and families that never received cash will choose center care.

As pointed out by Rhode Island administrators, our results that indicate that increased availability of formal care (e.g. preschool care in centers) lead families to more

frequently choose formal care for their children have implications for facilities development efforts. For example, our results indicate that increasing the availability of center-based preschool care from 0 slots per hundred preschool children to 10 slots per 100 preschool children significantly increases the probability that families will place their preschoolers in centers. Administrators wishing to increase the use of center care could work to increase the availability of center care in low-income communities. See pp. 85-89 of the full report for details.

The above results for the availability of care and education do not reflect the large increases in the availability of formal care that came about in the poorest RI townships (i.e., the core cities) as a result of its reform of the early care and education system. Please refer to Witte and Queralt (2002) for details regarding the expansion of care and education from 1998 to 2001.

#### *Impact of Other Township Factors*

We find limited significant impacts (after controlling for other factors) on child care choice from the binaries set up to represent the various townships of residence of the current and former cash recipients and families that never received cash in our study and from the Census 2000 variables used to describe various community characteristics, such as percent of the population in poverty, median family income, percent of employed mothers with young children, percent of families living in the same residence between 1995 and 2000, percent of workers using public transportation and percent of residents of driving age who own a car.

For current and former cash recipients with one child care subsidy, we find that residence in Newport or Central Falls, as compared to residence in the Balance of the State, is associated with significantly lower odds of enrolling their children in family child



care rather than informal care. In contrast, we find that families that never received cash with one subsidy and residing in Woonsocket, as compared to those residing in the Balance of the State, are significantly more likely to use their subsidy to buy family child care rather than informal care.

We find some evidence that, for current and former cash recipients and families that never received cash with three child care subsidies, the higher the income level of the community of residence, the lower the probability that these families will use family child care or different types of care for their children and, correspondingly, the higher the chances of using informal care. This was unexpected. Possibly it may be that, as the neighborhood median income increases, formal providers in the community become somewhat less eager to seek out as many subsidized clients as in neighborhoods with lower median incomes or possibly higher income relatives are less likely to need to work and, hence, more available to provide informal care.

We find that as the use of public transportation increases among workers in the residential community, families that never received cash are significantly more likely to use their subsidies to purchase family child care and significantly less likely to rely on informal care or on center care. Among current and former cash recipients, care choices in response to public transportation issues are less clear-cut; however, we do find among current and former cash recipients with one child care subsidy (and even more markedly among families that never received cash with 2 child care subsidies) significantly less reliance on center care than on informal care, as the percent using public transportation in the community increases. Perhaps families without a car find it easier to rely on providers who are more flexible in their schedules.

We find effects of car ownership levels in the community only for current and former cash recipients with one child care subsidy. For such families, as community car ownership levels increase, their use of formal providers (centers and family child care) decreases significantly. Again, this was unexpected. We conjecture that in communities where car ownership levels are higher (which tend to be communities with higher median family incomes), providers may be somewhat less eager to seek out as many clients with child care subsidies as in communities with lower levels of car ownership (generally communities with lower median family incomes).

***Question 4: Do households with two children in subsidized care and with three children in subsidized care behave differently than households with only one child receiving child care subsidies?***

We find strong evidence, presented throughout this report, that families with one child care subsidy make significantly different care choices than families with two subsidies. We also provide strong evidence that families with two subsidies make significantly different child care choices than families with three subsidies. From a research point of view, this means that it is important to analyze care choices for all the subsidized children in the family rather than just for one child (typically the youngest) as it is generally done. For program administrators and field practitioners, it means that it is necessary to gather information about the pattern of choices made by families with multiple children in care, if the objective is to get a complete and accurate picture of the child care choices of families receiving child care subsidies.

## **An Examination of the Child Care Choices of Low-Incomes Families Receiving Child Care Subsidies**

Many important policy changes took place in Rhode Island (RI) as a result of the State's 1999 reform of its child care subsidy program, which is considered to be among the most comprehensive and innovative in the U.S. RI's reform of its child care subsidy program was undertaken to support low-income families and to ensure that all children were given an opportunity to benefit from quality early care and education and before-school and after-school services (see Appendix A at the end of this report for details).

In this paper we assess the impacts of these reforms and other factors on the child care choices made by families receiving child care subsidies in RI during the period beginning in July 1998 and ending in June 2002. Our study is based on RI Department of Human Services (DHS) administrative data on households receiving child care subsidies that were either current or former recipients of cash assistance or households not on cash assistance between May 1996 and June 2002. The families we study have one, two or three children receiving subsidized child care.

As far as we are aware, this work represents the first time that families' choices of care for more than one child have been modeled jointly. Our results suggest that modeling the choice of care for the youngest child only, as is commonly done, may result in a partial and inaccurate representation of the child care choices parents make. This is because we find that the factors affecting the care choices of families with more than one child in subsidized care are quite different from the factors affecting choice among families with a single child in care.

We analyze a total of 237,918 monthly observations of 13,621 current and former cash assistance families receiving child care subsidies and 103,997 monthly

observations of 5,765 families receiving child care subsidies that did not receive cash assistance between May 1996 and July 2002. We also include in our analysis township data on the availability of Head Start, Kindergarten, and formal child care in RI, as well as Census data and data on employment.

Using econometric modeling, we estimate separate multinomial logit procedures for current and former cash assistance families (hereinafter referred to as “current and former cash recipient families”) and for income-eligible families that did not received cash assistance between May 1996 and June 2002 (hereinafter referred to as “families that never received cash”). We find that RI’s reforms of its child care subsidy program resulted in a significant reduction in the use of informal care and a corresponding increase in the use of formal care, particularly family child care, by participating current and former cash recipients and families that never received cash.

We find that the majority of parents choose center care for their children, regardless of whether they have one, two, or three child care subsidies. The next most frequently chosen type of care is family child care. We find that the use of informal care is limited and has declined substantially in recent years.

Our results indicate that parents with two or three child care subsidies very seldom choose mixed care, that is, one type of care for one child and another type of care for another. Even parents with three children in subsidized care by and large keep all three children in either center-based care, family child care or, to a lesser extent, all three in informal care.

We find that various socio-demographic and availability factors significantly affect the child care choices that parents make, including: 1) whether or not the family currently receives or previously received cash assistance, 2) the age of parent and child

3) racial/ethnic background, 4) educational level, 5) U.S. citizenship status, 6) availability of Head Start, kindergarten, and formal care in the community, 7) whether school is in session, 8) township of residence, and 9) availability of public transportation.

This report is structured as follows. The Executive Summary included at the beginning presents a comprehensive summary of our findings. In section 1, we describe the setting of our study. Section 2 describes our models. Section 3 discusses the data we use. Section 4 contains our empirical specification. Section 5 summarizes our empirical models. Section 6 covers our descriptive findings. Section 7 discusses our analytic results. Section 8 contains our conclusions.

### **1. THE SETTING – STATE OF RHODE ISLAND**

Rhode Island is the smallest of the New England states and has a population of 1,048,319, according to the year 2000 Census (U.S. Bureau of the Census, 2002). The State occupies a small land area--1,045 square miles--and has a density of 1,003 persons per square mile. Compared to the U.S. as a whole, which has a population density of 80 persons per square mile, RI is very densely populated.

According to the 2000 Census, the RI population is 82% non-Hispanic/non-Latino white, 8.7% of Hispanic/Latino origin (of any race), 4.5% black or African American, and 2.3% Asian. American Indians, Alaska natives, native Hawaiians, and Pacific Islanders comprise less than 1% of the population (U.S. Bureau of the Census, 2002). Compared to the State population, there are disproportionate numbers of Hispanics and blacks receiving child care subsidies in RI. For example, in April 2001, among those receiving child care subsidies for whom there was racial or ethnic background information in the Department of Human Services (DHS) administrative files (i.e., 84% of child care

subsidy recipients), 52% were white, 32% were Hispanic, 17% were black, and 1% were Asian or Pacific Islanders.

According to the 2000 Census, the 1999 poverty rate in RI for individuals of all ages was 11.9%, somewhat under the 12.7% poverty rate for the U.S. population. For children, the poverty rate in RI in 1999 was 16.5%, compared to 20.5% poverty rate for children in the U.S. population. However, poverty is highly concentrated in the core cities in RI, particularly in Providence, Central Falls, Pawtucket, Woonsocket, and Newport. Census 2000 data revealed a poverty rate (among children under age 18) of 40.8% in Central Falls, 40.1% in Providence, 31.3% in Woonsocket, 24.5% in Pawtucket, and 23.8% in Newport (U.S. Bureau of the Census, 2002).

According to the 2000 census, median household income in 1999 in RI was \$42,090, compared to \$40,816 for the U.S. as a whole. In 2000, 78% of the population 25 years of age and over in RI were high school graduates and 25.6% were college graduates (U.S. Bureau of the Census, 2002). In contrast, among heads of household in families receiving child care subsidies in April 2001, for example, only 52% had a high school education and only 23% had some education beyond high school.

## ***2. THE MODELS***

We model the probability that low-income families receiving child care subsidies will choose different types of child care for their children. We develop separate models for families: (1) with one subsidized child, (2) with two subsidized children and (3) with three subsidized children. Separate models are needed because the choice set for families with different numbers of subsidized children are different.

In a previous paper, we estimated a model of the family's choice to receive or not to receive child care subsidies (Queralt and Witte, 2003). For this paper, we

consider only families using subsidies for at least one child and for not more than three children.<sup>3</sup> Consider the options open to a family with one child care subsidy. Such family, as shown in Figure 1, can use their subsidy to purchase: (1) center care, (2) family child care or (3) informal care.

A family with two child care subsidies has a wider array of choices, as depicted in Figure 2. The family may: (1) place both children in center care, (2) place both children in family child care, (3) place both children in informal settings or (4) choose a different type of care for each child. For convenience we refer to the fourth option as “mixed care.” As we report later, mixed care is not used often. For this reason, we place all the types of mixed care we observe in a single category.

A family with three child care subsidies has an even wider array of choices, as shown in Figure 3. The family may: (1) place all three children in center care, (2) place all three children in family child care, (3) place all three children in informal settings or (4) choose different types of care for different children.

There is a large literature on the determinants of the type of child care used by families. See Burstein (1999) for a recent survey. This literature provides guidance on the selection of explanatory variables and is a good beginning point for developing a model of child care choice for families with one child care subsidy. However, the existing literature provides little guidance for developing models for families with more than one child.

Building on the existing literature, we see the various combinations of child care settings chosen by subsidized families as being dependent on the policies and

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<sup>3</sup> That is, for this paper we abstract from the subsidy/no subsidy choice and concentrate on the type of care chosen by families using subsidies. In our data, we observe families receiving subsidies for up to 7 children. However, less than 3% of families receive subsidies for more than three children. During the period of our study, 56% of families received subsidies for a single child, 31% received subsidies for two children and 10% received subsidies for three children.

administration of the child care subsidy program,<sup>4</sup> the information that is available to the family, how beneficial the family perceives each care combination to be (i.e., the options depicted in Figures 1, 2 and 3) and the nature of the local labor market and child care market.

The eligibility rules for child care subsidies in RI (discussed in greater detail in Appendix A at end of report) differ depending on whether or not a low-income family is also receiving cash assistance and whether there are one or two parents in the household. Summarizing briefly, families receiving cash assistance (i.e., with incomes below the Federal Poverty Level [FPL]) are eligible to receive child care subsidies for all their age-eligible children (i.e., children less than 16 years of age) if they are: (1) single-parent families working or engaged in approved activities (e.g., education, training, Job Club) for 20 or more hours per week, or (2) two-parent families with one parent working at least 35 hours per week and the second parent working or engaged in approved activities for at least 20 hours per week. Other families with incomes below 225% of the FPL are eligible for child care subsidies for all their age-eligible children if they are (1) single-parent families working 20 or more hours per week or (2) two-parent families and each parent is employed 20 or more hours per week.

Methods of obtaining information about the child care subsidy program and sources of information differ depending upon whether or not the family is receiving cash assistance. Families receiving cash assistance work closely with a social worker to develop an Individual Employment Plan (IEP).<sup>5</sup> The IEPs are generally completed within 45 days of entry to the cash assistance program. These plans identify the steps that the

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<sup>4</sup> For families receiving cash assistance, the policies and administration of the cash assistance program will be relevant as well.

<sup>5</sup> Some cash assistance families (e.g., those with severe disabilities, those with a head of household 60 years old and over) are exempt from the IEP requirement.



adults in each family intend to take to become financially self sufficient within the shortest practicable time. As part of the IEP, the social worker discusses the child care subsidy program and how the family can use the program to help achieve self sufficiency.

Low-income families that are not on cash assistance generally learn about the child care subsidy program from providers, friends, co-workers or neighbors. They can apply for subsidies at a centralized office by phone or by mail.

Under our model, families will select the care option(s) (see Figures 1-3) that they perceive will yield the highest level of well being (including the well being of their children), subject to the constraints of the policies of the cash assistance program (if they are on cash assistance) and of the subsidized child care program, subject to the information that is available to them and subject to conditions in the local labor market and the local child care market.

All the families in our sample have at least one child receiving child care subsidies. For families with a single subsidized child, the family will choose from the types of care they perceive to be available to them by comparing the costs and benefits of each type.<sup>6</sup> In other words, all other things being equal, we see a family with a single subsidized child as choosing the type of care that they think will maximize the expected present value of their utility over the expected duration of child care subsidy receipt, given program rules applicable to them and given the information available to them.

As depicted in Figures 2 and 3, families with more than one subsidized child face a larger set of potential choices. They have to decide what type of care to use for each

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<sup>6</sup> We consider three types of care, namely center care, family child care and informal care. Note that all three types of care may not always be available. For example, many families working non-standard hours may not have center care available. Families newly arrived in a community may have limited, if any, informal care options.

subsidized child. While the decisions are more complicated, we see the decision process as proceeding along lines similar to that for a family with a single subsidized child. Families with two or three subsidized children will choose the set of care options for their children by comparing the perceived costs and benefits of the different types of care options available to them.<sup>7</sup> In other words, we see a family with two or three subsidized children as choosing the set of care options that they think will maximize the expected present value of their utility over the expected duration of child care subsidy receipt.

Formally speaking, we see families as comparing, over the expected duration of child care subsidy receipt (denoted  $d$ ), the level of well being (denoted  $U$ ) they expect to receive from each of the care options available to them (e.g., depicted in Figure 1 for families with a single subsidized child). We assume that families' well being depends upon earned income ( $E$ ) net of child care costs, transportation costs and other costs of working ( $wc$ ), how many leisure hours they have ( $l$ ) and the well being of their children ( $C$ ). For families receiving cash assistance, the level of cash assistance payments and the policies of the cash assistance program ( $CA$ ) will also impact the family's well being under each care option. Individuals evaluate their level of well being under each care option using the information available to them, denoted  $I$ . The family's expected level of well being under option  $i$  (any one of the care options relevant to the family as depicted in Figures 1-3) over the expected length of time that they believe they will keep this care option is<sup>8</sup>

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<sup>7</sup> Note that choosing different types of care for different children will generally result in higher costs in terms of time and transportation.

<sup>8</sup> To keep the model simple, we do not discount benefits and costs that occur in the future. Incorporation of a discount rate, as done in Anderson and Meyer (1997), would not be difficult. However, given the generally short duration of child care subsidy, we do not believe that incorporation of a discount rate merits the added complexity (Meyers, et al., 2001).

$$\sum_{t=1}^d U(E_t^i - wc_t^i, CA_t^i, l_t^i, C_t^i) | I.$$

Families will choose the care option that maximizes their expected utility subject to program rules (e.g., eligibility requirements for child care subsidies), the information that they have available and the opportunities available in the local labor market and child care markets.

To illustrate, consider the choice between using subsidies to purchase center care for two children (option 1 in Figure 2) and using subsidies to purchase family child care for one child and center care for the other (option 4 in Figure 2). Let the family's perceived benefits of receiving a subsidy to cover child care expenses potentially be of both monetary and non-monetary form. A net monetary benefit (e.g., a decrease in child care costs net of any required payment by the parent), denoted  $b$ , may decrease the costs of working. A non-monetary benefit may increase the well being of the children, for example, the parent may consider the child's well being ( $C$ ) to be higher when the child is in one type of care rather than in another. The utility of choosing option 1 is

$$\sum_{t=1}^d U(E_t^1 - (wc_t^1 - (b_t^1)), (CA^1), (l_t^1), C_t^1) | I.$$

and the utility of choosing option 4 is

$$\sum_{t=1}^d U(E_t^4 - (wc_t^4 - (b_t^4)), (CA^4), (l_t^4), C_t^4) | I.$$

The low-income family will choose option 1 if

$$\sum_{t=1}^d U(E_t^1 - (wc_t^1 - (b_t^1)), (CA^1), (l_t^1), C_t^1) | I > \sum_{t=1}^d U(E_t^4 - (wc_t^4 - (b_t^4)), (CA^4), (l_t^4), C_t^4) | I.$$

In considering the implications of the above model, it is important to understand that, for all the families receiving child care subsidies in RI and in many other states, the cost of care does not vary according to the type of care chosen. Under such a co-payment system, all the providers families may choose from (i.e., any center-based or family child care provider that accepts subsidies or any informal provider) cost the same to the family. The cost to the family is the amount of the co-payment the family is required to make.

Summarizing briefly, co-payments in RI vary according to family income and size, but they do not vary according to type of provider (see Appendix A for more details). Families with incomes below the FPL are not required to make any co-payment when using child care subsidies. This means that, for such families, all types of child care available to them are free of any cost to the family. Families with incomes above the FPL are required to make modest co-payments, which increase with income and decrease with family size. However, required co-payments never exceed 10% of family income. Further, the cost of the co-payment for the second child in subsidized care is 75% of the co-payment for the first child, and the cost of the co-payment for the third child in subsidized care is 50% of the co-payment for the first child.

Obviously, the relative prices of different types of child care are very different when participating in the child care subsidy program than when purchasing care that is not subsidized. Without subsidies, the most expensive type of care available to the family may be 10 times more expensive than the least expensive type of care. In contrast, the most expensive type of care available with a child care subsidy costs exactly the same as the least expensive type of care. We would expect this dramatic

difference in relative prices to make it far more likely that families will choose more expensive care when using subsidies than when they do not use them.

The availability and quality of various types of care for children with subsidies depends not only on the availability of that type of care in the community but also on how much the State pays providers for subsidized care (this payment to providers is referred to as the reimbursement rate). Between 1997 and 2000, RI increased provider reimbursement rates by 71%. In addition, since January 2000, RI has complied with State legislation requiring that reimbursement rates be set at the 75th percentile of the market prices paid for each type of care, as determined by a survey of prices that is not more than two years old.<sup>9</sup> At least partly as a result of these rate increases, by 2001, 87% of licensed centers and certified family child care homes in RI accepted children with child care subsidies. Few other states have such high rates of provider participation in the subsidized child care program. For example, 41% of providers accept children with child care subsidies in Massachusetts and less than 30% of providers accept children with child care subsidies in Miami-Dade County and Broward County, Florida.

Finally, the reader should note that choosing mixed care (for example, placing one child in family child care and another in center-based care) increases time and transportation costs. Hence, according to our model, families should exhibit a strong tendency to place all their children in the same care setting.

### ***3. THE DATA***

To estimate models for the child care choices of low-income families using child care subsidies, we construct a monthly longitudinal database for the period beginning in

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<sup>9</sup> The January 2000 reimbursement rates were set at the 75<sup>th</sup> percentile of the 1998 market rate survey, and the January 2002 reimbursement rates were set at the 75<sup>th</sup> percentile of the 2000 market rate survey.

July 1998 and ending in June 2002. The database contains information on all families that received child care subsidies in RI during the study period.

The longitudinal database contains: (1) RI Department of Human Services (DHS) administrative data for the child care subsidy program, (2) information on the availability of Head Start in each RI township, (3) information on Kindergarten programs for all townships in RI, (4) information on the accessibility, availability and stability of formal child care in all RI townships, (6) monthly information on employment growth for all townships and (7) Census 2000 data for all RI townships.

We began our data work by cycling through monthly files for the RI cash assistance program for the period May 1996 through June 2002 to discern if families receiving child care subsidies during our study period were ever on RI's cash assistance program, the Family Independence Program (FIP). Of the 19,386 families that received child care subsidies between July 1998 and June 2002, 13,621 families received cash assistance at some time between May 1996 and June 2002. Of these 13,621 families currently or previously on cash, 8,838 received subsidized care for one child, 3,702 received subsidized care for two children and 1,081 received subsidized child care for three children. For convenience, in this report we refer to these current and former cash assistance families as "current and former cash recipient families." Five thousand seven hundred sixty-five families receiving child care subsidies never received cash assistance between May 1996 and June 2002. Of these 5,765 families, 3,977 received subsidized child care for one child, 1,446 received subsidized child care for two children, and 342 received subsidized child care for three children. For convenience, we refer to these income-eligible families as "families that never received cash."

We carry out separate analyses for these two groups because the child care information available to them and their incentive structures are quite different.

#### ***4. EMPIRICAL SPECIFICATION***

As noted earlier, Figures 1, 2 and 3 describe the care options available to three distinct types of families: (1) families with one subsidized child, (2) families with two subsidized children and (3) families with three subsidized children.

Families are not static. That is, they have additional children and their children lose child care eligibility as they become older. The process of aging can reasonably be assumed to be exogenous. It has often been argued that fertility is jointly determined together with the use of social welfare programs, particularly the old AFDC cash assistance program. However, the literature suggests that cash assistance program rules have small, if any, effects on fertility. See Blank (2002) for a recent survey. On a priori grounds, child care subsidy programs should have much smaller impacts on fertility than either AFDC or the current cash assistance programs. Hence, we estimate models that assume that fertility is also exogenous to the child care subsidy choice and, thus, we allow new children to enter the family when they begin to receive child care subsidies.

The probability of a low-income family choosing a particular care option depends on the factors identified in our model (see the previous section), including: (1) the level of earnings, (2) the costs of working, (3) the value of all social welfare benefits (child care subsidies, cash assistance, food stamps & medical assistance), if any, net of monetary transaction/stigma costs of receiving social welfare benefits, (3) the value of leisure time net of non-monetary costs (e.g., the disapproval of friends, the time costs of applying for and using cash assistance and child care subsidies), (4) the well being of the children, (5) the policies of the child care subsidy and cash assistance programs and

the way in which these programs are administered, (6) the nature of the local labor market, (7) the availability, accessibility and stability of local early care and education programs and (8) the information available to and used by the family.

We estimate the reduced-form of this model. That is, we include only variables that are either exogenously determined or predetermined. These variables will be related to the underlying theoretical variables, but they will not be determined simultaneously with the probability that a low-income family chooses one of the care options depicted in Figures 1-3. Thus, for example, we include education rather than earnings in our specification.

### **The Variables**

Table 1 (in Appendix B) lists the variables that we include in our specification, indicates at what level they are observed (e.g., township, household), whether they vary across time, in the cross section or both, and gives the data source for each variable. Table 2 (Appendix B) presents mean values for selected household-level variables for: (1) all current and former cash recipients and (2) all families that never received cash. Table 2 also provides probabilities (i.e., P-values) that the mean values for current and former cash recipient families are equal to the mean values for families that never received cash.

#### *Household-level variables*

The household-level variables include human capital and socio-demographic variables and the families' community of residence when first observed. All family/household-level variables, except community of residence, vary both in the cross-section and across time. We hold community of residence constant at the first observed



location because it is possible that family mobility is determined simultaneously with child care choices.

The human capital and family-demographic variables include: (1) age and educational level of the head of household, (2) age of each subsidized child in the family and percent of the subsidized children in the family in various age groups, (3) variables reflecting race/ethnicity of the family, (4) whether or not the family has two working adults, (5) whether the family receives child support payments, (6) the citizenship status of the household head, (7) community of residence of the family when first observed, (8) the number of months that the family received cash assistance between May 1996 and July 1998 (the 26 months prior to our study period) and (9) the number of months that the family received child care subsidies between May 1996 and July 1998.

The number of months that a household received FIP payments or child care subsidies in the 26 months prior to our study may be correlated with the error term in our child care choice model. To explore this possibility, we estimate models both with and without these two variables. Ultimately, based on our findings, we select models that leave these two variables out of the specification. However, we retain the descriptive statistics because they provide additional contextual information.

As detailed above, we have included a number of variables to represent the children in the household, such as their ages and the number of children of middle-school and secondary-school age. Research has shown that families often desire different types of child care, depending on the ages of their children. Also, in families with children of middle-school and secondary-school age, the older siblings may provide

some care or company for younger siblings, and thus their presence may alter the family's child care choices.

When we estimate child care choice models for families receiving child care subsidies, we also include the fraction of subsidized children in the family that are: (1) infants, (2) toddlers, (3) preschoolers and (4) eligible for kindergarten. The suppressed category is school-age children. We do this because we believe that the age-composition of the children in the family, as well as the ages of individual children, may affect the household's child care choices. This may occur because families seek to economize on the time and money costs of transporting children to and from care by placing, whenever possible, all the children in a single care setting. Families may also want children in the same, rather than different care settings, so that the children may provide support for one another and so that they may keep an eye on one another.

#### *Township variables*

Table 3 (in Appendix B) provides descriptive statistics for the township-level variables we use. We include variables that reflect: (1) the availability of child/youth care and early education, (2) the accessibility of child/youth care, (3) the stability of care and early education; (4) the local labor market conditions and (5) other community characteristics.

Our vector of variables related to the availability of child/youth care and early education includes the number of full-time preschool center slots per 100 children under age 5 in the township in 1998 (the beginning of our study period), the number of family child care slots per 100 children ages 0-13 in the township in 1998 and the number of school-age center and school-based slots per 100 school-age children in the township in 1998. We also include a variable that interacts the township availability of full-time

preschool care with the fraction of children under age 5 in each family and another variable that interacts the township availability of school-age care with the fraction of school-age children in the family. We hold the supply of child/youth care early education at the 1998 level because the contemporaneous availability of care will be determined simultaneously with child care choices.

In the availability vector, we also include variables to reflect daily hours and months open for kindergarten and Head Start in the township. Typically both kindergarten and Head Start programs operate part-day, part-year programs. Recognizing this and the need for low-income parents to work, the child care subsidy program often provides after-care (i.e., “wrap-around care”) for children enrolled in kindergarten and Head Start.

To be more specific, we include in the availability vector the proportion of eligible children enrolled in part-day and full-day kindergarten<sup>10</sup> in the township of residence, as well as the proportion of eligible children less than 5 years of age living in families with incomes below the FPL who are enrolled in Early Head Start and regular Head Start programs in the township of residence in each of the years of our study. To reflect the part-year nature of most kindergarten and Head Start programs, we obtained opening and closing dates for all programs. During the period when programs are closed, we set the proportion of children served to zero.

While we hold the availability of formal early care and education at its 1998 level, we initially allowed the availability of kindergarten and Head Start to vary over the

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<sup>10</sup> While all RI townships have some part-day and/or some full-day kindergarten available, few townships provide services to all kindergarten-eligible children. The proportion of kindergarten-eligible children served in part day programs ranges from 0% to 100% of eligible children across townships, with a median 67% percent of eligible children served in part-day kindergarten programs. The proportion of kindergarten-eligible children served in full-day programs also ranges from 0% to 100% of eligible children across townships, but with a median of only 14% percent of eligible children served in full-day kindergarten programs.

study period. We did this because we initially believed that both the local school districts' decisions regarding the number of part-day and full-day kindergarten slots to be funded and the federal government's decisions regarding the funding of Head Start grants<sup>11</sup> could be reasonably assumed to be exogenous to the child care and subsidy choices of low-income families in our sample. However, we found that decisions regarding child care offerings by the state are made with knowledge of kindergarten and Head Start offerings in an effort to complement and supplement these offerings where needed. Therefore, to avoid endogeneity, in the final set of analyses performed, we hold the availability of these programs at their AY 1998-1999 level.

In the analyses, we multiply the availability of various kinds of early care and education by the fraction of children in the family that might use each particular type of care or education. We do this to reflect how well the child care needs of the family might be served by the particular type of care. For example, we multiply the fraction of eligible children served in full-day kindergarten programs by the proportion of the children in the family eligible for kindergarten.<sup>12</sup>

Consider two different families to get an idea of how the above-mentioned variables operate. The first family has only one child, and the child is eligible for kindergarten. The family lives in a township that provides full-day kindergarten for all eligible children. The second family has three children. One of the children is kindergarten eligible. The family lives in a township that provides part-day kindergarten to 60% of eligible children. Kindergarten can serve a substantial portion of the child care needs of the first family during the school year. However, the child care needs of the second family would be much less adequately served by the kindergarten services

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<sup>11</sup> Head Start has been in existence since the 1960s, and most Head Start providers have received federal grants for the last 20 years.

<sup>12</sup> Children are eligible for kindergarten in Rhode Island if they are 5 years old by December 31.

available to them. The child care choices the first family makes are likely to be far more affected by the availability of kindergarten than the child care choices of the second family.

To reflect the accessibility of child care, we initially included two variables: (1) the number of child care centers per square mile in the township and (2) the number of family child care homes per square mile in the township. We used the child care licensing lists for July 2000 to calculate these variables. We would have preferred to use the licensing lists for 1998, but they were not available. To check on the possibility that these two accessibility variables might be correlated with the error term in the child care choice model, we estimated models both with and without these accessibility variables and ultimately left them out of the specification.

To control for the continuity of formal care, an important aspect of quality, we include the turnover rate for the staff working at child care centers in the township. Turnover rates were calculated using Unemployment Insurance earnings records. The earliest year for which we had complete records was 1999; thus, we use the turnover rate for that year.

To control for local labor market conditions, we include the average monthly change in employment, by township, for each quarter of our study. We also include a variable from the 2000 Census that reflects the prevalence of odd-hour jobs and shift work. The variable is the percent of the population leaving for work between 10AM and 6 AM. Such people would need child care providers with operating hours starting before 7 AM or closing after 6 PM.

Using data from the 2000 Census, we also control for a number of characteristics of townships. The Census variables included in our specification are: (1) median family

income, (2) percent of families in poverty, (3) percent of mothers with children under 6 years of age in the work force and (4) percent of people residing in the same house from 1995 to 2000,<sup>13</sup> (5) the percent of workers in the township using public transportation and (6) the percent of persons 16 years of age and over that own cars.

*Binary variables to reflect time*

Because of the many changes that occurred during our study period, we impose no structure on the pattern of change over time. Instead, we create a separate binary variable for all months except the first month of our study period (July 1998). This non-parametric representation of time allows each month to have a distinct impact on the probabilities that the families in our sample will make each one of the child care choices depicted in Figures 1-3. We interpret the coefficients on the monthly binaries in light of our knowledge of the pattern of policy and administrative changes that occurred during the study period.

**5. EMPIRICAL MODEL**

To summarize, the probability that a low-income family in our sample will be choose one of the choice options depicted in Figures 1-3 depends upon the factors described above and listed in Table 1. These exogenous factors are denoted  $x$ .

We estimate separate multinomial logit models for current and former cash recipient families and for families that never received cash. For families with one subsidized child, we estimate a model including the child care choices depicted in Figure 1. That is, we estimate a model for the probability that the family will choose center care, family child care or informal care for the child.

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<sup>13</sup> According to Morenoff & Earls (1999), this variable is highly correlated with a community's "collective efficacy for children."

For families with two children in subsidized care, we estimate a simplified version of the model depicted in Figure 2. Because we rarely observe families choosing one type of care for one child and a different type of care for the other, we collapse the mixed care options (options 4-6 in Figure 2) into a single category.<sup>14</sup> That is, we estimate a model for the probability that the family will choose center care for both children, family child care for both children, informal care for both children or a different type of care for each of the two children (mixed care).

For families with three subsidized children, we estimate a simplified version of the model depicted in Figure 3. As we did for families with two subsidized children, we collapse the mixed care options (options 4-10 in Figure 3) into a single category.<sup>15</sup> That is, we estimate a model for the probability that the family will choose center care for all three children, family child care for all three children, informal care for all three child or different types of care for different children (mixed care).

Consider the logit model for a family with two subsidized children. Under the multinomial logit model, the probability that the family will make a particular care choice, say center care for both children, is:

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<sup>14</sup> Only 5.57% of families that never received cash with two child care subsidies, on average, over all the sample months, chose mixed care: 3.91% chose option #4 in Figure 2 (i.e., center for one child and family care for the other), 1.56% chose option #5 (center-based care for one child and informal care for the other), and only 1/10 of 1% chose option #6 (family child care for one child and informal care for the other). Only 6.03% of current and former FIP families with two child care subsidies, on average, over all sample months, chose mixed care: 3.86% chose choice #4, 2.06% chose option #5 and approximately 1/10 of 1% chose option #6.

<sup>15</sup> Among families that never received cash with three child care subsidies, on average, over all the sample months, 11.58% chose mixed care: 5.88% chose option #4 in Figure 3 (i.e., center-based care for two children and family child care for one), 1.68% chose option #5 (center care for two children and informal care for one), 2.94% chose option #6 (center for one child and family child care for two), 6/10 of 1% chose option #7 (center for one child and informal care for two), 1/10 of 1% chose option #8 (family child care for two children and informal care for one), slightly less than 3/10 of 1% chose option #9 (family child care for one child and informal care for two), and slightly less than 1/10 of 1% chose option #10 (center for one, family child care for one, and informal care for one). Among current and former FIP families with three children in subsidized care, over all sample months, 7.89% chose mixed care: 3.22% chose option #4 in Figure 3, 2.34% chose option #5, 1.27% chose option #6, 7/10 of 1% chose option #7, slightly less than 3/10 of 1% chose option #8, less than 1/10 of 1% chose option #9, and none chose option #10.

$$(1) P(y = j / x) = \frac{\exp(x\beta_j)}{1 + \sum_{h=1}^3 \exp(x\beta_h)}$$

where  $\beta_j$  is a  $k \times 1$  vector of parameters to be estimated.<sup>16</sup> Since the sum of the probabilities of all possible choices must be 1, one choice is suppressed and the probabilities of other choices are estimated relative to the probability of the suppressed choice. We suppress the informal care choice since we are interested in how changes in the policies and administration of the child care subsidy program changed the likelihood that families would choose formal care.

Since we observe families over time, we are able to control for unobservable family-specific attributes, as well as for observable attributes. To account for these unobservable family specific effects, we allow for separate error variances for each family.<sup>17</sup>

## **6. DESCRIPTIVE FINDINGS**

As can be seen in Table 2, current and former cash recipient families are significantly different from families that never received cash receiving child care subsidies in nearly all the human capital and family-demographic measures.<sup>18</sup>

On average, current and former cash recipient families (compared to families that never received cash) are significantly more likely to have a high school degree, to be U.S. citizens, to be black, to have younger children, and to reside in Central Falls,

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<sup>16</sup> Because the probability of all possible statuses must add up to 1, the probability that a family that never received cash will be in the base status is 1 over the denominator of equation (1). See Green, 2003 or Wooldridge, 2002 for a discussion of the multinomial logit model.

<sup>17</sup>See Greene (2003) or Wooldridge (2002) for more detailed discussions of using longitudinal data to control for unobservable family-specific effects. Note that failure to control for unobservable family specific effects will lead to inconsistent parameter estimates.

<sup>18</sup>Families that never received cash in our study did not receive cash assistance between May 1996 and June 2002. Current and former FIP families and families that never received cash receiving child care subsidies are not significantly different in terms of the percent of subsidized children in the family that are kindergarten-eligible and the percent of families residing in Pawtucket and in West Warwick.



Newport, Providence or Woonsocket. Compared to families that never received cash, current and former cash recipient families are significantly less likely to receive child support payments, less likely to be Hispanic, and less likely to have two working adults in the household.

Figure 4 (in Appendix B) shows the number of current and former cash recipient families with one child care subsidy in our sample that chose center care, family child care or informal care for their child. Figure 5 (Appendix B) shows the number of families that never received cash with one child care subsidy that made each of these choices. Both figures show that current and former cash recipient families and families that never received cash are most likely to choose center care rather than family child care or informal care. On average, over all the sample months, 73% of current and former cash recipient families and 75% of families that never received cash with one child care subsidy choose center care. Current and former cash recipient families with one child care subsidy are also less likely than families that never received cash to choose family child care (16% vs. 19%). Families that never received cash with one child care subsidy are much less likely than current and former cash recipient families to choose informal care for their child (6% vs. 11%).

As can be seen in Figures 4 and 5, the number of families that never received cash assistance and current and former cash recipient families with one child care subsidy choosing to enroll their child in center care or family child care increased during the study period, while the number of families from both groups choosing informal care declined. Among current and former cash recipient families with one child care subsidy, the proportion choosing center care increased from 72% in July 1998 to 75% in June of 2002, the proportion choosing family child care considerably increased from 12% to

19% and the proportion using informal care declined dramatically from 16% to 5%. Among families that never received cash with one child care subsidy, the proportion choosing center care decreased from 78% in July 1998 to 72% in June of 2002, while the proportion choosing family child care increased substantially from 14% to 24%, and the proportion choosing informal care was cut by one half, from 8% to 4%.

Figure 6 (Appendix B) shows the number of current and former cash recipient families with two child care subsidies in our sample that made each of four possible choices--center care, family child care, informal care or a different type of care for each of their two children (mixed care). Figure 7 (Appendix B) shows the number of families that never received cash with two child care subsidies that made each of these four choices. We find that both current and former cash recipient families and families that never received cash with two subsidies are most likely to choose center care for both of their subsidized children. On average, over all sample months, 61% of current and former cash recipient families and 68% of families that never received cash choose center care for both children, 16% of current and former cash recipient families and 17% of families that never received cash chose family child care for both children, and 17% of current and former cash recipient families and 9% of families that never received cash chose informal care for both. On average, only 6% of all families with two child care subsidies in our sample choose mixed care options for their two children (see footnote 12 for details).

As can be seen in Figures 6 and 7, the number of families with two child care subsidies choosing formal care increased during our study period, while the likelihood of choosing informal care declined. Specifically, among current and former cash recipient families with two child care subsidies, the proportion choosing center care increased

from 61% in July 1998 to 64% in June of 2002, the proportion choosing family child care doubled from 11% to 22%, the proportion using informal care declined dramatically from 22% to 9%, and the proportion using any of the mixed care options declined from 6% to 5%. Among families that never received cash with two child care subsidies, the proportion choosing center care decreased from 71% in July 1998 to 68% in June of 2002, the proportion choosing family child care increased considerably from 9% to 17%, the proportion choosing informal care declined from 12% to 9%, and the use of mixed care options declined from 7.1% to 4.5%.

Figures 8 and 9 (Appendix B) show the number of current and former cash recipient families (Figure 8) and families that never received cash (Figure 9) with three child care subsidies in our sample that chose center care for all three children, family child care for all three children, informal care for all three children, and various types of care (mixed care) for their three children. Both current and former cash recipient families and families that never received cash with three child care subsidies are most likely to choose center care for all three children. To be more precise, on average, over all sample months, 51% of current and former cash recipient families and 60% of families that never received cash chose center care for all three children. Sixteen percent of both current and former cash recipient families and families that never received cash chose family child care for all three children. Twenty-five percent of current and former cash recipient families and 13% of families that never received cash chose informal care for all three children. Eight percent of current and former cash recipient families and 12% of families that never received cash chose mixed care for their three children.

Over time, the patterns of choice we observe are as follows. From July 1998 to June 2002, among current and former cash recipient families with three child care subsidies, the proportion choosing center care increased from 50% to 56%, the proportion choosing family child care tripled from 8% to 24%, the proportion using informal care declined dramatically from 34% to 14% and the proportion using any of the mixed care options remained stable at 8%. Among families that never received cash with three child care subsidies, from July 1998 to June 2002, the proportion choosing center care decreased slightly from 62% to 60%, while the proportion choosing family child care doubled from 10% to 20%, the proportion choosing informal care declined drastically from 18% to 8%, and the use of mixed care options increased slightly from 10% to 12%.

Table 4 (Appendix B) provides descriptive statistics for the families in our study. The information is broken down by type of family (families that never received cash vs. current and former cash recipient families) and by whether they had one, two, or three children receiving child care subsidies. As can be seen in this table, both current and former cash recipient families and families that never received cash with different numbers of subsidized children differ significantly on most socio-demographic measures. For example, families with one subsidized child are more likely to be white than families with two or three subsidized children. By way of contrast, the percent of minority families is greater among families with two or three subsidized children than among families with one subsidized child.

Figures 10, 11, and 12 (in Appendix B) provide additional information about race/ethnicity, educational level and child support status of the families in our study. Figure 10 shows, for example, that in the period from July 1998 to June 2002, the data

recorded on race and ethnicity of families receiving child care subsidies contains a substantial and increasing proportion of missing values. This underscores the need for caution in using the data on race/ethnicity. This information pertains only to families for whom data on their race/ethnicity was entered in the administrative record.

On Figure 11 we provide information on the education of families that never received cash and current and former cash recipient families receiving child care subsidies over the four-year period of our study. Both types of families show a decline in the proportion headed by a person with 12 years of education and more than 12 years of education, and the decline is steeper for families that never received cash. Figure 11 also shows an increase in the proportion of families that never received cash headed by a person for whom the administrative record shows zero years of education.

Figure 12 shows a major decline in the proportion of families that never received cash and current and former cash recipient families receiving child care subsidies who are receiving child support. The decline is particularly dramatic for families that never received cash.

## ***7. EMPIRICAL RESULTS***

In this section, we describe the results of estimating the model of child care choices for families with (1) one child in subsidized care, (2) two children in subsidized care and (3) three children in subsidized care. We estimate separate models for current and former cash recipient families and for families that never received cash.

Tables 5 and 6 and Figures 13 through 15 (all in Appendix B) summarize results for current and former cash recipient families and for families that never received cash with one child enrolled in subsidized child care. Tables 7 and 8 and Figures 16 through 18 (Appendix B) summarize results for current and former cash recipient and families

that never received cash with two children in subsidized care. Tables 9 and 10 and Figures 19 through 21 (Appendix B) summarize results for current and former cash recipients and families that never received cash with three children in subsidized care. The tables summarize findings for the household-level socio-demographic variables and for the township-level variables in our study. The figures summarize results for the binary variables, which represent each month of our study period. These monthly binaries in the figures are used to reflect the impacts of changes in child care policies and administration in RI as well as other changes occurring during the time of the study (July 1998 to June 2002) on the probability that families would make significant changes in their child care choices and on the probability that families would use informal care.

### **Understanding How RI Policy and Administrative Changes**

#### **Impact Family Choices**

When assessing changes in child care choices, it is important to keep in mind that families generally do not make changes in their child care arrangements on a monthly basis. Rather, they are most likely to reconsider and possibly change their arrangements at the beginning and end of the school year. This is because many of the programs in which their children are enrolled are school-based programs (e.g., kindergarten, elementary and secondary school, after-school care) or other part-year programs (e.g., Head Start) that tend to begin and end at times that often coincide with the beginning and end of the school year. During the summer, parents must make different arrangements for the children who have been enrolled in these programs that run on a calendar similar to the school year. There are many special programs (e.g., summer camps) to care for children during the summer. Families also tend to take

vacations during the summer. Consequently, June and September are the two months during which families are the most likely to alter their child care arrangements.

The fact that family decisions regarding child care arrangements are made infrequently means that it is unlikely that changes in child care policy and administration will have an immediate effect. Rather, policy impacts will largely be seen the next time parents assess their child care choices. For example, the impact of the increase in provider reimbursement rates and the eligibility expansions that took place in January 1999 will likely be observed in June 1999 and September 1999, rather than in February 1999 or March 1999.

### **Results: Impacts of RI Child Care Subsidy Program Policies**

#### **(Evidence #1: Major Decline in the Use of Informal Care)**

In this section we provide evidence that RI's child care subsidy program policies during the period of our study resulted in a major decline in the use of informal care by current and former cash recipient families and families that never received cash.

#### *Families with One Child in Subsidized Care*

Figure 13 provides the predicted probability that the median current and former cash recipient family with one child care subsidy<sup>19</sup> and the median family with one child

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<sup>19</sup>The median current and former cash recipient family with one child in subsidized care resides outside the core cities and has a household head who is white, 27 years old, and a U.S. citizen with a high school education. The family is not receiving child support, and there is only one working adult in the household. The family's child receiving subsidized care is slightly under the age of four (3.92 years old). When the family first received child care subsidies, the family resided in a community, which in 1998 had 19 preschool center slots per 100 preschoolers, 3 family child care slots per 100 children ages 0-13 and 11 slots per 100 children of school age. The residential community had no Head Start or kindergarten available during the 1998-1999 academic year. The median quarterly turnover rate of workers at child care centers in the FIP median family's community was 14% in 1999. Jobs in the family's township of residence grew, on average, .32% per month and 31% of the workers in the community left for work at odd hours (i.e., between 10AM and 6AM). Sixty-two percent of mothers with children under age 6 in the median family's community worked outside the home, the median family income in the community was \$31,775, 17% of families in the community had incomes below poverty, 3% of residents used public transportation to go to work, 76% of the persons over age 16 had automobiles and 57% had resided in the same house from 1995 to 2000.

care subsidy that never received cash assistance<sup>20</sup> would use their subsidy to place their child in informal care. These estimates control for all of the factors listed in Table 1. For ease of interpretation, we also provide breakout boxes in Figure 13 indicating when RI's major child care policy and administrative changes occurred.

As can be seen in Figure 13, during the period of our study, the likelihood that the median family with one child care subsidy would use their subsidy to buy informal care declined substantially for both families that never received cash and current and former cash recipient families. To be more specific, we estimate that the probability that the median family with one child care subsidy that never received cash assistance would use it to buy informal care was 7.3% in July 1998, and that such probability went down to 3.8% by June 2002. Similarly, we estimate that the probability that a current and former cash recipient family with median characteristics would use their subsidy to place their subsidized child in informal care was 10.7% in July 1998, and that it was down to 3.1% by June 2002. These estimates control for all factors listed in Table 1. Figure 13 shows that the median current and former cash recipient family with one child care subsidy was more likely to use it to place their subsidized child in informal care than the median family that never received cash assistance until September 2001. But the

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<sup>20</sup>The median family with one child in subsidized care that never received cash assistance resides outside the core cities and has a 31-year-old household head who is a U.S. citizen. This median family has missing racial/ethnic information, and the head of the household has less than a high school education. The family is not receiving child support, and there is only one working adult in the household. The family's child in subsidized care is slightly over 4 years of age (i.e., 4.18 years old). When the family first received child care subsidies, the family resided in a community with 19 preschool center slots per 100 preschoolers, 3 family child care slots per 100 children ages 0-13 and 11 school age slots per 100 school-age children in 1998. The median no-cash family's residential community had no Head Start or kindergarten available during the 1998\_1999 academic year. The median quarterly turnover rate of workers at child care centers in the family's community of residence was 14% in 1999. Jobs in the community grew on average .28% per month, and 31% of workers left for work at odd hours (i.e., between 10AM and 6AM). Sixty-three percent of mothers with children under the age of 6 in the median no-cash family's community worked outside the home, 17% of families in the community had incomes below poverty, the median family income was \$31,775, 2.7% of residents used public transportation to go to work, 76% of the persons over age 16 had automobiles and 57% had lived in the same house from 1995 to 2000.



likelihood of using informal care became approximately equal for both families between September 2001 and June 2002.

More specifically, Figure 13 shows that, for current and former cash recipient families with one child care subsidy, the first major decline in the use of informal care occurred between May and September 1999. We believe that this decline was the result of the delayed impact of the January 1999 increase in provider reimbursement rates and expansion of both age eligibility and income eligibility for child care subsidies. Then a second major decline in current and former cash recipient families' use of informal care occurred between May and September 2000. We believe that this reflects the very large provider reimbursement rate increases that were implemented in RI in January 2000. A further major decline in current and former cash recipient families' use of informal care began around June 2001 and continued up to the end of our study period in June 2002. During this time the Comprehensive Child Care Services Program (CCCSP) began enrolling children,<sup>21</sup> and several important administrative policy changes were instituted (i.e., de-linking family eligibility from enrollment with a specific provider, portable vouchers and crack-down on informal providers not meeting subsidy standards).

For families that never received cash with one child care subsidy, Figure 13 shows that the decline in the use of informal care only began in June-September 2000. We suspect that this lagged effect of the January 1999 and June 1999 eligibility expansions and provider reimbursement rate increases resulted from families' that never received cash limited knowledge of these policy changes until the large January 2000

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<sup>21</sup> In April 2001 Rhode Island began enrolling 3- and 4-year-old children living in families with incomes below 108% of FPL in its Comprehensive Child Care Services Program. This program provides comprehensive services to children in communities that are not well served by the Head Start program (e.g., Central Falls and Pawtucket). Both families that never received cash assistance and current and former recipient families were eligible for this program and were actively recruited by RI DHS.

reimbursement rate increases led providers to actively recruit families that never received cash. A second substantial decline in families' that never received cash use of informal care began in June 2001 after RI DHS began actively enrolling families in the CCCSP and the decline continued after the administrative reforms of June 2001 up to January 2002. Since January 2002 and up to June 2002, the proportion of families that never received cash using their child care subsidy to purchase informal care increased slightly.

The decline described above in the use of informal care by both current and former cash recipients and families that never received cash with one child care subsidy was accompanied by an increase in the use of family child care. Specifically, we estimate that the probability that a family that never received cash assistance with median characteristics would place their subsidized child in family child care was 7.5% in July 1998, and it increased to 11% by June 2002. The probability that such a family with median characteristics would use their child care subsidy to purchase center care remained the same, that is, it was 85% in July 1998 and it was 85% in June 2002. Similarly, the probability that a current and former cash recipient family with median characteristics would use their child care subsidy to purchase family child care was 15.2% in July 1998, and it increased to 21.2% in June 2002. The probability that a current and former cash recipient family with median characteristics would use their child care subsidy to obtain center care was 74% in July 1998, and it increased slightly to 76% in June 2002. Again, these estimates hold constant the effects of all variables listed in Table 1.

*Families with Two Children in Subsidized Care*

Figure 18 provides the predicted probabilities that the median current and former cash recipient family with two child care subsidies<sup>22</sup> and the median family with two child care subsidies that never received cash assistance<sup>23</sup> would use their subsidies to place their children in informal care. These estimates control for all of the factors listed in Table 1.

As can be seen in Figure 18, during the period of our study, there was a substantial decline in the likelihood that the median family that never received cash assistance or current and former cash recipient family with two child care subsidies would use their child care subsidies to buy informal care. To be more specific, we estimate that the probability that the median family with two child care subsidies that never received cash assistance would place their subsidized children in informal care

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<sup>22</sup>The median current and former cash assistance recipient family with two children in subsidized care resides outside the core cities and has a household head who is 28 years old and a U.S. citizen with a high school education. We have no information in the DHS child care files as to the racial/ethnic background of the head of household. The family is not receiving child support, and there is only one working adult in the household. The older of the two children in the household who are receiving subsidized care is 6.6 years old and the younger child receiving subsidized child care is 3.5 years old. When the family first received child care subsidies, the family resided in a community, which in 1998 had 19 preschool center slots per 100 preschoolers, 3 family child care slots per 100 children ages 0-13 and 11 slots per 100 children of school age. The residential community had no Head Start or kindergarten available during the 1998-1999 academic year. The median quarterly turnover rate of workers at child care centers in the FIP median family's community was 14% in 1999. Jobs in the family's township of residence grew, on average, .28% per month and 34% of the workers in the community left for work at odd hours (i.e., between 10AM and 6AM). Fifty-six percent of mothers with children under age 6 in the median family's community worked outside the home, the median family income in the community was \$30,819, 19% of families in the community had incomes below poverty, 3.7% of residents used public transportation to go to work, 76% of the persons over age 16 had automobiles and 52% had resided in the same house from 1995 to 2000.

<sup>23</sup>The median family with two children in subsidized care that never received cash assistance resides outside the core cities and has a 32-year-old household head who is a U.S. citizen. We have no information in the DHS child care files as to the racial-ethnic background or level of education of the head of household. The family is not receiving child support, and there is only one working adult in the household. The older of the two children in the household who are receiving subsidized care is 7.5 years old and the younger child receiving subsidized child care is 4.2 years old. When the family first received child care subsidies, the family resided in a community with 19 preschool center slots per 100 preschoolers, 3 family child care slots per 100 children ages 0-13 and 11 school age slots per 100 school-age children in 1998. The median IE family's residential community had no Head Start or kindergarten available during the 1998\_1999 academic year. The median quarterly turnover rate of workers at child care centers in the family's community of residence was 14% in 1999. Jobs in the community grew on average .28% per month, and 31% of workers left for work at odd hours (i.e., between 10AM and 6AM). Sixty-two percent of mothers with children under the age of 6 in the median IE family's community worked outside the home, 17% of families in the community had incomes below poverty, the median family income was \$31,775, 3.7% of residents used public transportation to go to work, 76% of the persons over age 16 had automobiles and 57% had lived in the same house from 1995 to 2000.

was 22.8% in July 1998, and that such probability went down to 9.8% by June 2002. Similarly, we estimate that the probability that the median current and former cash recipient family with two child care subsidies would place their subsidized children in informal care was 24.1% in July 1998, and that such probability was down to 8.9% by June 2002. These estimates control for all the factors listed in Table 1. Figure 18 shows that, from August 1998 until February 2000, the median family with two child care subsidies that never received cash assistance was somewhat more likely to place their subsidized children in informal care than the median current and former cash recipient family. Then from March 2000 to April 2001, the median current and former cash recipient family was somewhat more likely to use informal care for their subsidized children than the median family that had never received cash assistance. Finally, from May 2001 until June 2002, the median family that never received cash assistance became slightly more likely than the median current and former cash recipient family to use their child care subsidies to purchase informal care for their two children.

More specifically, Figure 18 shows that, for current and former cash recipient families with two child care subsidies, the first major decline in the use of informal care occurred between July 1999 and February 2000. We believe that this decline was the result of the delayed impact of the January 1999 increase in provider reimbursement rates and expansion of both age eligibility and income eligibility for child care subsidies and of the large provider reimbursement rate increases that occurred in RI in January 2000. A second major decline in current and former cash recipient families' use of informal care started around March 2001 and continued until June 2002. During this time the Comprehensive Child Care Services Program (CCCSP) was enrolling children and several important administrative policy changes were instituted (i.e., de-linking of

eligibility and enrollment with a provider, portable vouchers and crack-down on informal providers not meeting subsidy standards).

For families that never received cash, Figure 18 shows a decline in the use of informal care between April 1999 and August 2000. We suspect that this decline was due to the January 1999 and June 1999 eligibility expansions and provider reimbursement rate increases, followed by the large January 2000 reimbursement rate increases, which led providers to actively recruit families that never received cash. A second substantial decline in the use of informal care by families that never received cash with two child care subsidies began in May 2001 at the time RI DHS began actively enrolling families in the CCCSP and continued until the end of our study period in June 2002. As previously noted, during this period several important administrative policy changes were instituted (i.e., de-linking of eligibility and enrollment with a provider, portable vouchers and crack-down on informal providers not meeting subsidy standards).

The decline in the use of informal care (described above) by both current and former cash recipients and families that never received cash with two child care subsidies was accompanied by an increase in the use of family child care and center care. Specifically, we estimate that the probability that the median family with two child care subsidies that never received cash assistance would use the subsidies to purchase family child care for both children was 3.4% in July 1998, and such probability increased to 8.9% by June 2002. The probability that an family that never received child care subsidies with median characteristics would use their child care subsidies to purchase center care for both children was 72% in July 1998, and it increased to 79.5% by June 2002. Similarly, the probability that the median current and former cash recipient family

with two child care subsidies would use them to purchase family child care for both children was 4.9% in July 1998, and it increased to 9.8% by June 2002. The probability that a current and former cash recipient family with median characteristics would use their subsidies to obtain center care for both children was 68.3% in July 1998, and it increased to 78.8% by June 2002. Again, these estimates are for the median family and, thus, they hold constant at median values all the variables listed in Table 1.

#### *Families with Three Children in Subsidized Care*

Figure 21 provides the predicted probabilities that the median current and former cash recipient family with three child care subsidies<sup>24</sup> would use their subsidies to purchase informal care for their children. These estimates hold constant at median values all the variables listed in Table 1. We do not include the results for the median family with three child care subsidies that never received cash assistance because we were unable to obtain stable predictions for this small group (i.e., 342 households).

As can be seen in Figure 21, the median current and former cash recipient family with three child care subsidies is very unlikely to place all three children in informal care. In addition, one can observe that the likelihood that such families would use their child care subsidies to buy informal care was substantially lower at the end of our study

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<sup>24</sup>The median current and former recipient family with three children in subsidized care resides outside the core cities and has a household head who is 29 years old and a U.S. citizen. We have no information in the DHS child care files as to the racial-ethnic background or level of education of the head of household. The family is not receiving child support, and there is only one working adult in the household. The eldest child in the household who is receiving subsidized care is 9 years old, the middle child receiving subsidized child care is 6.6 years old, and the youngest child receiving subsidized care is 3.2 years old. When the family first received child care subsidies, the family resided in a community, which in 1998 had 19 preschool center slots per 100 preschoolers, 3 family child care slots per 100 children ages 0-13 and 11 slots per 100 children of school age. The residential community had no Head Start or kindergarten available during the 1998-1999 academic year. The median quarterly turnover rate of workers at child care centers in the FIP median family's community was 15% in 1999. Jobs in the family's township of residence grew, on average, 0.28% per month and 34% of the workers in the community left for work at odd hours (i.e., between 10AM and 6AM). Fifty-six percent of mothers with children under age 6 in the median family's community worked outside the home, the median family income in the community was \$26,867, 29% of families in the community had incomes below poverty, 4% of residents used public transportation to go to work, 62% of the persons over age 16 had automobiles and 45% had resided in the same house from 1995 to 2000.

period than at the beginning. To be more specific, we estimate that the probability that the median current and former cash recipient family with three children would place all three children in informal care was 3.4% in July 1998, and that such probability went down to 9/10 of 1% by June 2002. These estimates control for all factors listed in Table 1.

More specifically, Figure 21 shows that, for current and former cash recipient families with three child care subsidies, the two periods of major decline in the use of informal care occurred between October 1998 and November 1999 and between July 2001 and June 2002. The first major period of decline in the use of informal care preceded and followed the eligibility expansions and provider rate increases of January 1999 and July 1999. The second major period of decline followed the establishment of the CCCSP and the institution of administrative policy changes (i.e., de-linking eligibility and enrollment with a provider, portable vouchers and crack-down on informal providers not meeting subsidy standards).

The decline described above in the use of informal care by current and former cash recipient families with three child care subsidies was accompanied by an increase in the use of center care for all three children. Specifically, we estimate that the probability that a current and former cash recipient family with median characteristics would place their three subsidized children in center care was 90.5% in July 1998, and this probability increased to 95.1% by June 2002. The estimated probability that a current and former cash recipient family with median characteristics would use their child care subsidies to purchase family child care for their three children remained 0% from July 1998 to June 2002.

## **Results: Impacts of RI Child Care Subsidy Program Policies**

### **(Evidence #2: Significant Increase in Choice of Formal Care)**

In this section we provide additional evidence that RI's child care subsidy program policies during the period of our study resulted in significant changes in the child care choices of current and former cash recipient families and families that never received cash favoring the use of formal care over informal care.

#### *Families with One Child in Subsidized Care*

Holding constant all other factors listed in Table 1, Figures 14 and 15 show, for all the months in our study period, the probability that the child care choices made by median families with one child care subsidy were significantly different in subsequent months from the choices they had made in July 1998, the first month of our study.<sup>25</sup>

As can be seen in Figure 14, child care choices made by current and former cash recipient families with one child care subsidy between August 1998 and May 1999 were insignificantly different from the choices they made in July 1998. However, beginning around June 1999, current and former cash recipient families became significantly more likely than they were in July 1998 to choose formal over informal care. Recall that the first set of child care subsidy eligibility expansions occurred in January 1999 and the second set of expansions occurred in July 1999. To be precise, the odds (or probability) that current and former cash recipient families with one child care subsidy would choose family child care relative to informal care were 44% higher in June 1999 than in July 1998. Similarly, the odds of choosing center care relative to informal care were 24% greater in June 1999 than in July 1998. A second large jump in the odds of choosing center care relative to informal care (42% greater chance of

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<sup>25</sup>The values used are 1 minus the P-Values for each of the monthly binaries, with July 1998 being the reference month.



choosing center care than informal care) occurs in September 1999 when families were exercising their 1999-2000 school-year care choices. We observe a slight decrease in the odds of choosing family child care over informal care (from 44% to 38% higher than in July 1998) after June 1999 and until September 1999.

For current and former cash recipient families with one child in subsidized care, we believe that the significant increase in the odds of their choosing formal care over informal care in June 1999 was the result of the provider reimbursement rate increases and eligibility expansions of January 1999, and that the additional increase in the odds of choosing center care over informal care in September 1999 was due to the July 1999 eligibility expansions and provider reimbursement rate increases.

For current and former cash recipient families with one child in subsidized care, the odds of choosing family child care relative to informal care begin to increase substantially again in January 2000 (i.e., 52% higher probability of choosing family child care over informal care in January 2000, relative to July 1998), and the odds continue to increase markedly and steadily so that by July 2000 the probability of choosing family child care over informal care relative to July 1998 is 94% higher). The odds of choosing center care relative to informal care also increase steadily though less rapidly than the odds for family child care, so that by June 2000 we observe a 60% higher probability of choosing center care rather than informal care, relative to July 1998. By September 2000, when families made their academic year 2000-2001 care choices, the odds of choosing both center and family child care, relative to informal care continue to increase. Specifically, the odds of choosing center care, relative to informal care, were 67% higher in September 2000 than in July 1998, and the odds of choosing family child care, relative to informal care, were 96% higher in September 2000 than in July 1998.

We believe that, for current and former cash recipient families with one child in subsidized care, the substantial increases in the odds of choosing formal care over informal care during the year 2000 were due to the very large provider reimbursement rate increases that occurred in January 2000.

We continue to observe markedly increased odds that current and former cash recipient families would choose either center care or family child care, relative to informal care, in September 2001, following the April 2001 introduction of the CCCSP and the administrative reforms of June 2001. Specifically, in September 2001, the odds that current and former cash recipient families would choose center care rather than informal care were over 2 ½ times higher than the odds in July 1998, and the odds of choosing family child care rather than informal care were 3.09 times higher than the odds in July 1998.

Following the January 2002 provider reimbursement rate increases, we continue to observe large increases in the odds that a current and former cash recipient family would choose either center or family child care, relative to informal care. Thus, by June 2002, the odds that current and former cash recipient families would choose center care rather than informal care were more than 3 ½ times higher than in July 1998, and the odds of choosing family child care rather than informal care were almost 5 times higher than in July 1998.

As can be seen in Figure 15, significant changes in the child care choices of families that never received cash with one child care subsidy came at a much later time than the changes in the child care choices of current and former cash recipient families with one subsidy. As noted before, we attribute this substantial lag to the more limited information families that never received cash had regarding child care policy changes.

Specifically, significant changes in the odds that families that never received cash would choose family child care, relative to informal care, did not begin to show until September 2000, following several provider reimbursement increases and eligibility expansions in January 1999, July 1999 and January 2000. In April 2001, when RI DHS began enrolling children in the CCCSP program, the odds that families that never received cash with one subsidized child would choose family child care rather than informal care were 92% higher than the odds in July 1998. For families that never received cash, a second large increase in the odds of choosing family child care rather than informal care occurred after the June 2001 administrative reforms. Thus, by December 2001, the odds that a family that never received cash assistance would choose family child care rather than informal care were over 2 1/2 times as large as the odds of such a choice in July 1998, and, by June 2002, they were almost three times as large.

With respect to the choice of center-based care over informal care, we first observe a significant increase in the odds that families that never received cash would make such a choice in September 2000, but the trend does not become consistently significant until after July 2001. By September 2001, the odds that families that never received cash would choose center care rather than informal care were 78% greater than the odds in July 1998, and by June 2002 they were almost twice as large.

#### *Families with Two Children in Subsidized Care*

Figures 16 and 17 show, for all the months in our study period, the probability that the child care choices made by families with two child care subsidies were significantly different in subsequent months from the choices they had made in July 1998, the first month of our study.

As can be seen in Figure 16, child care choices made by current and former cash recipient families with two child care subsidies between August 1998 and May 1999 were insignificantly different from the choices they made in July 1998. However, beginning in June 1999, current and former cash recipient families with two child care subsidies became significantly more likely (than they were in July 1998) to choose center care over informal care. This significant change in choice of care followed the child care subsidy eligibility expansions and provider reimbursement increases of January 1999 and was supported by another round of eligibility expansions and provider reimbursement increases in July 1999. To be more precise, the odds (or probability) that current and former cash recipient families with two child care subsidies would choose center care (relative to informal care) for both children were 31% higher in June 1999 than in July 1998. With respect to family child care, it is not until June 2000 that such families became significantly more likely than they were in July 1998 to choose family child care for both children, rather than informal care. Specifically, the odds of choosing family child care for both children, relative to informal care, became 40% higher in June 2000 than they were in July 1998. This followed the very large provider reimbursement rate increases that occurred in January 2000.

For current and former cash recipient families with two children in subsidized care, the odds of choosing family child care for both children relative to informal care continued to increase substantially and steadily so that by April 2001 they were 2.1 times higher than they were in July 1998, by September 2001 they were three times higher than they were in July 1998 and by June 2002 the odds of choosing family child care over informal care were 5.4 times higher than the odds were in July 1998. The odds of choosing center care for both children relative to informal care also increased,

though less rapidly. By April 2001 they were 51% higher than they were in July 1998; by September 2001 they were 2.3 times higher than in July 1998 and by June 2002 they were 3.1 times higher than in July 1998. These major increases in the probability of choosing family child care or center care relative to informal care followed the April 2001 introduction of the CCCSP, the administrative reforms of June 2001, and the January 2002 provider reimbursement rate increases.

As can be seen in Figure 17, significant changes in the child care choices of families that never received cash with two child care subsidies came at a much later time than the changes in the child care choices of current and former cash recipient families with two children in subsidized care. As noted before, we attribute this substantial lag to families that never received cash having more limited access to information regarding child care policy changes. Specifically, significant changes in the odds that families that never received cash would choose family child care for both children, relative to informal care, did not happen until March 2000, following several rounds of provider reimbursement increases and eligibility expansions (i.e., January 1999, July 1999, January 2000). Specifically, the odds of choosing family child care rather than informal care for both children were 67% higher in March 2000 than they were in July 1998. In April 2001, when RI DHS began enrolling children in the CCCSP program, the odds that families that never received cash with two child care subsidies would choose family child care for both children rather than informal care were 2.9 times higher than the odds in July 1998. For families that never received cash, another large increase in the odds of choosing family child care rather than informal care occurred after the June 2001 administrative reforms. Thus, by December 2001, the odds that a family that never received cash assistance would choose family child care rather

than informal care were over 4.3 times higher than the odds of making such a choice in July 1998 and by June 2002 the odds were almost 6 times higher.

With respect to the choice of center-based care over informal care, we first observe a significant increase in the odds that families that never received cash would make such a choice in November 2000, but the trend does not become consistently significant until July 2001, following the start of the CCCSP program in April 2001 and the administrative reforms of June 2001. By September 2001, the odds that families that never received cash would choose center care rather than informal care for both children were 45% greater than the odds in July 1998 and by June 2002, following the January 2002 provider rate increases, they were over 2 ½ times higher than the odds of choosing center care in July 1998.

#### *Families with Three Children in Subsidized Care*

Figures 19 and 20 show, for all the months in our study period, the probability that the child care choices made by families with three child care subsidies were significantly different in subsequent months from the choices they had made in July 1998, the first month of our study.

As can be seen in Figure 19, child care choices made by current and former cash recipient families with three child care subsidies between August 1998 and December 1998 were insignificantly different from the choices they made in July 1998. However, beginning in January 1999, such families became significantly more likely than they were in July 1998 to choose center care over informal care. This significant change in choice of care coincided with the child care subsidy eligibility expansions and provider reimbursement increases of January 1999. Specifically, by January 1999, current and former cash recipient families with three child care subsidies were 75% more likely than

they were in August 1998 to choose center care for all three children rather than informal care. By September 1999 we observe another jump in the odds of choosing center care rather than informal care. To be more precise, the odds (or probability) that current and former cash recipient families with three child care subsidies would choose center care relative to informal care for all three children were 93% higher in September 1999 than in July 1998. This increase followed another round of eligibility expansions and provider reimbursement increases in July 1999. The next large increase in the odds of choosing center care over informal care (i.e., 2.3 times higher odds than the odds in July 1998) occurred in September 2000, following the provider rate increases of January 2000. We observe another large increase in the odds of choosing center care over informal care in September 2001 (i.e., three times higher odds than the odds in July 1998), following the beginning of the CCCSP and institution of the June 2001 reforms. Still another large increase in the odds of choosing center care over informal care occurs in January 2002 (i.e., 3.7 times higher odds than the odds in July 1998), coinciding with the January 2002 provider rate increases. For these families, the odds of choosing center care over informal care were 3.8 times higher by June 2002 than they were in August 1998.

Beginning in January 1999, current and former cash recipient families with three child care subsidies also became significantly more likely than they were in July 1998 to choose family child care over informal care. This significant change in choice coincided with the child care subsidy eligibility expansions and provider reimbursement increases of January 1999. Specifically, by January 1999, current and former cash recipient families with three child care subsidies were 2.2 times more likely than they were in July 1998 to choose family child care for all three children rather than informal care. By

September 2000, we observe another jump in the odds of choosing family child care rather than informal care. To be more precise, the odds (or probability) that current and former cash recipient families with three child care subsidies would choose family child care relative to informal care for all three children were 3.2 times higher in September 2000 than the odds in July 1998. This increase followed another round of eligibility expansions and provider reimbursement increases in July 1999 and a large provider rate increase in January 2000. Between July and September 2001, we observe a major increase in the odds of choosing family child care over informal care so that by September 2001 the odds of choosing family child care are 6.1 times higher than the odds in July 1998. This followed the beginning of the CCCSP and the institution of the June 2001 reforms. Still another increase in the odds of choosing family child care over informal care occurred in January 2002 (i.e., 8 times higher than the odds in July 1998), coinciding with the January 2002 provider rate increases. For current and former cash recipient families, by June 2002 the odds of choosing family child care over informal care were still 7 ½ times higher than they were in July 1998.

As can be seen in Figure 20, our predictions of changes in the child care choices of families that never received cash with three child care subsidies failed to achieve consistent significance during the period of our study, although the trend after March 2001 was toward borderline significance. This failure to achieve significance at the .05 or higher level may have been due to the small sample size (i.e., only 342 households).

### **Results: Impacts of Family Demographics and Township-Level Factors on Family Child Care Choices**

For the household socio-demographic and township-level explanatory variables (except the availability of care and education variables), Tables 5 through 10 report, for



each unit change in each variable, the change in the odds of choosing center-based care or family child care, rather than informal care. A value greater than 1 attached to a particular variable indicates that a unit change in the variable increases the odds<sup>26</sup> that families will choose center care or family child care or a mixture of different types of care, instead of informal care. A value less than 1 for the odds indicates that a unit change in the variable decreases the odds of choosing center, family or mixed care, rather than informal care. Tables 5 through 10 also report the probability (P-Values) that each explanatory variable has no significant impact on the odds of choosing each type of care.

For variables related to the availability of care and education, we report the impacts of a standard deviation change, rather than a unit change. We do this because a unit change is not observed in our data for most of these variables.

Tables 5 through 10 summarize results for a model that contains only variables that can reasonably be assumed to be exogenous or predetermined. In all cases, the results we report are based on controlling all the other variables in Table 1.

## **Impact of Family Demographic Variables**

### ***Impact of Racial-Ethnic Background***

#### *Families with One Child in Subsidized Care*

Results presented in Table 5 indicate that the odds that Hispanic current and former cash recipient families with one child care subsidy would choose to use it to purchase center care rather than informal care are significantly lower than for other racial/ethnic groups of current and former cash recipient families. We estimate that the odds that a Hispanic current and former cash recipient family would choose center care

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<sup>26</sup> The odds are represented in the tables as the probability of center care, family child care or mixed care over the probability of informal care for a unit change of each variable.

rather than informal care are only 76% of the odds that other racial/ethnic groups of current and former cash recipient families would choose center care rather than informal care in RI. Table 5 also shows that black current and former cash recipient families with one child care subsidy are significantly less likely to use their subsidy to purchase family child care than informal care. Specifically, we estimate the odds that a black current and former cash recipient family would choose family child care rather than informal care are only 61% of the odds that other racial/ethnic groups of current and former cash recipient families would choose family child care rather than informal care.

Table 6 shows that black families that never received cash with one child care subsidy are significantly more likely to use their subsidy to enroll their child in center-based care than in informal care. Specifically, we estimate the odds that a black family that never received cash assistance would choose center care rather than informal care at 2.38 times higher than the odds that other racial/ethnic families that never received cash would choose center rather than informal care.

Note that the impact of race/ethnicity on child care choices is substantially different for current and former cash recipients and families that never received cash. For example, Hispanic families that never received cash are not significantly more likely to choose informal care rather than center care; but Hispanic current and former cash recipient families are. Black current and former cash recipient families are significantly more likely to choose informal care than family child care, but black families that never received cash are not. Black families that never received cash are significantly more likely to choose center care rather than informal care, but black current and former cash recipient families are not.

*Families with Two Children in Subsidized Care*

Results in Table 7 show that the odds that a Hispanic current and former cash recipient family with two child care subsidies would choose exclusively center care (rather than informal care) for its two children are significantly lower than for other racial/ethnic groups. Specifically, we estimate the odds of such a family choosing center care rather than informal care for their two children at only 69% of the odds that other similarly situated current and former cash recipient families belonging to other racial/ethnic groups would choose center care rather than informal care in RI.

Results in Table 8 indicate that race/ethnicity has no significant impact on the likelihood that families that never received cash with two child care subsidies will choose center care rather than informal care or that they will choose family child care rather than informal care.

#### *Families with Three Children in Subsidized Care*

Results in Table 9 show that white, non-Hispanic current and former cash recipient families with three children in subsidized care are significantly more likely to choose different types of care for their children than other racial/ethnic current and former cash recipient families. Specifically, such families are almost three times more likely to choose mixed care rather than informal care for all three children, as compared to other racial/ethnic current and former cash recipient families. Table 9 also shows that the odds that a Hispanic current and former cash recipient family with three children in subsidized care would choose center care (rather than informal care) for all three children are significantly lower than for other racial/ethnic groups of current and former cash recipient families. Specifically, we estimate that the odds that such a family would choose exclusively center care rather than informal care for all three children are only 54% of the odds that other similarly situated current and former cash recipient

families belonging to other racial/ethnic groups would choose exclusively center care rather than informal care.

As can be seen in Table 10, race/ethnicity has no significant impact on the likelihood that a family that never received cash assistance with three child care subsidies will choose center care or family child care rather than informal care for its children.

### ***Impact of Parent's Education***

#### *Families with One Child in Subsidized Care*

We find, as shown in Table 6, that the odds that a family that never received cash assistance headed by a person with a high school education would choose to use their one child care subsidy to purchase family child care rather than informal care are significantly lower than for other more educated or less educated families that never received cash. We estimate that the odds that such a family would choose family child care rather than informal care are 36% lower than the odds that other more educated or less educated families that never received cash would make such choice.

We find no significant effects of education on the child care choices of current and former cash recipient families with one subsidized child.

#### *Families with Two Children in Subsidized Care*

The odds that a current and former cash recipient family headed by a person with more than a high school education would choose center care (rather than informal care) for both children in subsidized care are significantly higher than for other less educated current and former cash recipient families. As shown in Table 7, we estimate that the odds that such a family would choose center care rather than informal care for

their two children are 34% higher than for other less educated current and former cash recipient families.

*Families with Three Children in Subsidized Care*

As in the case of current and former cash recipient families with two children, we find, for current and former cash recipient families with three child care subsidies a significant and positive relationship between the level of education of the head of household and choice of either center care or different types of care rather than purely informal care for all three children, as compared to other less educated current and former cash recipient families with three subsidies. As shown in Table 9, the odds that current and former cash recipient families headed by a high school graduate would choose center care rather than informal care for all three children are 55% higher than for other less educated current and former cash recipient families, and the odds are 85% higher if the family is headed by someone with more than a high school education. Similarly, Table 9 shows that the odds that a current and former cash recipient family headed by a high school graduate would choose different types of care rather than informal care for all three children are 75% higher than for other less educated current and former cash recipient families, and the odds of making such a choice are 88% higher if the family is headed by someone with more than a high school education.

Interestingly, while more educated current and former cash recipient families are more likely to choose formal rather than informal care for their children, more education does not seem to have a significant effect on the child care choices of families that never received cash with two or three subsidized children. And we find that more education actually decreases the likelihood that families that never received cash with one subsidized child will choose family child care rather than informal care.

## ***Impact of U.S. Citizenship***

### *Families with One Child in Subsidized Care*

We find that current and former cash recipient families headed by a non-citizen and with a child care subsidy are significantly more likely to choose to purchase family child care rather than informal care, as compared to current and former cash recipient families headed by a U.S. citizen. Specifically, for current and former cash recipient families with one subsidy, we estimate that the odds of choosing family child care rather than informal care are 66% higher for families headed by a non-citizen than for families headed by a U.S. citizen. Non-citizen current and former cash recipient families with a child care subsidy are also significantly less likely to purchase center care for their child.

Our results suggest that citizenship status has no significant impact on the child care choices of families that never received cash with one child care subsidy.

### *Families with Two Children in Subsidized Care*

We notice a significant preference for family child care rather than informal care among both non-citizen current and former cash recipient families and families that never received cash with two child care subsidies, compared to current and former cash recipients and families that never received cash headed by a U.S. citizen. Specifically, Table 7 shows that the odds of choosing family child care rather than informal care for both children are 60% higher for current and former cash recipient families headed by a non-citizen than for current and former cash recipient families headed by a U.S. citizen. Similarly, for families that never received cash, Table 8 shows that the odds of choosing family child care relative to informal care for both children are almost 2 to 1.

Note that this is one of the rare instances in which a socio-demographic factor has similar impact on current and former cash recipients and families that never received cash.

#### *Families with Three Children in Subsidized Care*

Table 9 indicates that the odds of choosing family child care or center care or mixed care over purely informal care are significantly higher for non-citizen current and former cash recipient families with three children in subsidized care than for similar current and former cash recipient families headed by a U.S. citizen. Specifically, for families headed by a non-citizen, we estimate the odds of choosing family child care or different types of care rather than informal care for all three children at over 2 to 1, and we estimate the odds of choosing center care for all three children at 73% higher than the odds of choosing purely informal care, compared to current and former cash recipient families headed by a U.S. citizen.

We find no significant impact of citizenship status on the child care choices of families that never received cash with three child care subsidies.

#### ***Impact of Parent's Age***

##### *Families with One Child in Subsidized Care*

We find that, on average, as the current and former cash recipient head of household with one subsidized child gets older, the likelihood that s/he will choose center care or family child care, instead of informal care, increases. To be more specific, as per results in Table 5 and additional tests for the joint significance of the two age variables (age and the squared value of age), we find a significant curvilinear relationship between age of the parent and preference for center care. At age 20, the probability that a current and former cash recipient head of household will use her child

care subsidy to buy center care is 70%, holding all other factors listed in Table 1 constant. The probability of choosing center care increases as the household head age increases, it peaks at 75% at age 30-35 and then it decreases to 71% by age 45 and to 67% by age 50.

The relationship between age and the choice of family child care increases continuously with age. To be more specific, we estimate that the odds that a current and former cash recipient head of household will use her child care subsidy to buy family child care are 15% at age 20, 16% at age 35, 18% at age 40, and 22% at age 50.

In contrast, we find a significant inverse and slightly curvilinear relationship between age and the choice of informal care. That is, we estimate that the typical current and former cash recipient head of household with one child care subsidy at age 20 has a 15% probability of selecting informal care for her two children, 11% probability at age 25, 10% at age 30, and 9% at ages 35 and 40. After age 40, current and former cash recipient heads of household show a somewhat increased probability of choosing informal care, namely, 10% chance at age 45 and 11% at age 50.

For the typical family that never received cash assistance, as per results in Table 6 and additional tests for the joint significance of the two age variables, we find no significant relationship between age of the household head and choice of family child care or informal care, holding the effect of all other variables in Table 1 constant. However, we do find that age (up to age 35) significantly increases the likelihood that parents that never received cash assistance will choose center care. At age 20, the probability that a typical head of household that never received cash assistance will use



her child care subsidy to buy center care is 82%. This likelihood of selected center care increases and peaks at 86% at age 35, and by age 50 it decreases to 84%.

#### *Families with Two Children in Subsidized Care*

Our results indicate that, as current and former cash recipient heads of household with two child care subsidies get older, they become significantly more likely to choose center-based care or family child care for their two subsidized children and significantly less likely to choose informal care for both. To be more precise, as per Table 7 and additional joint tests on the age variables, we estimate that, on average, current and former cash recipient heads of household with two child care subsidies at age 20 have a 58% probability of choosing center care for both children, 65% at age 25, and 69% at age 30. The probability of choosing center care peaks at age 35 at 71% and then decreases slightly to 70% at age 40, 67% at age 45 and 62% at age 50. As to the odds of choosing family child care, we find a steady increase with age. That is, on average, a typical current and former cash recipient head of household with two child care subsidies at age 20 has a 4% chance of selecting family child care for her two children, 5% probability at ages 25-30, 6% probability at ages 35-40, 7% probability at age 45 and 8% probability by age 50. In contrast, we find a significant and inverse relationship between age and the choice of informal care. That is, we estimate that the typical current and former cash recipient head of household at age 20 has a 35% probability of selecting informal care for her two children, 27% probability at age 25, 23% at age 30, and 20% at ages 35-40. After age 40, current and former cash recipient heads of household show a somewhat increased probability of choosing informal care, namely, 21% at age 45 and 25% at age 50.

We find no significant relationship between age of the household head and child care choices for families that never received cash with two child care subsidies.

*Families with Three Children in Subsidized Care*

We find that age significantly impacts child care choices for current and former cash recipient families but not families that never received cash with three child care subsidies. To be more specific, the probability that a current and former cash recipient family with three subsidized children will choose center care for all three children is 96% when the household head is 20 years old. The probability of choosing center care declines to 88% at age 35 and, then, it increases again to 94% when the household head is age 50.

***Impact of Child's Age***

*Families with One Child in Subsidized Care*

As to the effects of the child's age on child care choices, as shown in Table 5, we find that for the typical current and former cash recipient family with one child care subsidy, for every one-year increase in the age of the child, there is a corresponding decrease of 24% in the odds that the family will choose family child care rather than informal care. Similarly, among families that never received cash with one child care subsidy, each year's increase in the age of the child decreases by approximately 28% the odds of choosing family child care relative to informal care.

*Families with Two Children in Subsidized Care*

For both current and former cash recipients and families that never received cash with two child care subsidies, we find that the ages of both children significantly impact child care choices. This means that when doing research it is important to consider the care choices for all the children in the family, rather than just for one child (typically the

youngest), as it is generally done. To be more specific, we find that for current and former cash recipient families, every one-year increase in the age of the younger child (child 2) increases the odds that the family will choose center care for both children, rather than informal care, by approximately 13%. But every one-year increase in the age of the older child (child 1) decreases the odds that the current and former cash recipient family will choose center care for both children by approximately 9% and decreases the odds of placing both children in family child care by 12%, both compared to informal care. Every one-year increase in the age of the younger child decreases the odds of placing the children in two different types of care rather than informal care by 51%, while every one-year increase in the age of the older child increases the odds of placing both children in two different types of care rather than in informal care by 11%.

Table 8 shows that for families that never received cash (same as for current and former cash recipient families) each year's increase in the age of the older child decreases the odds of placing both children in family child care, rather than informal care, by 15%. Also similar to the finding for current and former cash recipient families, each one-year's increase in the age of the younger child decreases the odds of placing the children in mixed care rather than informal care by 56%.

#### *Families with Three Children in Subsidized Care*

For families that never received cash with three subsidized children, our results suggest that the age of the youngest child is the most important of the child ages in determining care choices, whereas for current and former cash recipient families with three subsidized children, it is both the age of the oldest and the age of the youngest child that impact child care choices. To be more specific, Table 9 shows that every one-year increase in the age of the oldest child (child 1) decreases the odds that a current

and former cash recipient family will choose center care for all three children, rather than informal care, by 10%. Every one-year increase in the youngest child's age (child 3) decreases by 40% the odds of placing the children in different types of care, relative to placing all three in informal care.

As can be seen in Table 10, for families that never received cash every one-year increase in the age of the youngest child increases by 33-34% the odds of placing all three children in center care or all three in family child care rather than in informal care. In addition, every one-year increase in the age of the youngest child decreases by 36% the odds of placing the three children in different types of care rather than in informal care.

### ***Impact of Having One or More Infants in Subsidized Care***

#### *Families with One Child in Subsidized Care*

Both current and former cash recipients and families that never received cash with a subsidized infant are significantly less likely to use center care or family child care, as opposed to informal care. Specifically, Table 5 shows that current and former cash recipient families are 100% less likely to enroll their subsidized infant in center-based care or family child care rather than in informal care, holding all other factors listed in Table 1 constant. The reluctance of families that never received cash with a subsidized infant to use center care or family child care is even greater. Table 6 shows that families that never received cash with an infant subsidy are three times less likely to use it to purchase center care, compared to informal care, and two times less likely to use it to purchase family child care rather than informal care.

#### *Families with Two Children in Subsidized Care*

Current and former cash recipient families appear to be unlikely to place their two subsidized children in different types of care, when at least one of them is an infant. Specifically, Table 7 shows that current and former cash recipient families with child care subsidies for an infant and for an older child are 100% less likely to enroll both in different types of care than in informal care. For current and former cash recipient families, having subsidies for an infant and for another child has no significant effect on the likelihood of choosing formal relative to informal care.

Table 8 shows that families that never received cash with subsidies for two children are quite unlikely to use center care (as compared to informal care) when at least one of the subsidized children is an infant. We estimate the odds that a family with two subsidies that never received cash assistance, one for an infant and one for an older child, would place them in center care at 150% lower than the odds of placing them in informal care. Table 8 also shows that the odds that families that never received cash will use their child care subsidies to purchase two different types of care, if one child is an infant and the other is older, are 2.5 times lower than the odds of placing them in informal care.

#### *Families with Three Children in Subsidized Care*

Current and former cash recipient families with child care subsidies for three children, one or more of whom are infants, are significantly less likely to use their subsidies to enroll all three children in center care or in different types of care (compared to informal care), and they are significantly more likely to enroll all three in family child care, as opposed to informal care. Our results in Table 9 show, for example, that current and former cash recipient families with subsidies for one infant and for two older children are 100% more likely to enroll all three in family child care

rather than in informal care, 67% less likely to enroll all three in center care and 100% less likely to enroll all three in different types of care, all compared to the odds of placing all three in informal care.

Interestingly, our results show no significant impact of having a subsidized infant on the child care choices of families that never received cash with three child care subsidies. Since we have only 342 families that never received cash with three child care subsidies, these results should be taken with caution.

### ***Impact of Having One or More Toddlers in Subsidized Care***

#### *Families with One Child in Subsidized Care*

Families that never received cash with a child care subsidy for a child ages 1-2 (i.e., a toddler) are significantly less likely to use it to get center care, as opposed to informal care. Specifically, Table 6 shows that families that never received cash are 200% less likely to enroll their toddler in center-based care, relative to informal care. For current and former cash recipient families, having a subsidy for a toddler has similar though only marginally significant impact on their choice of care (see Table 5).

#### *Families with Two Children in Subsidized Care*

Families that never received cash with two children in subsidized care at least one of whom is a toddler are significantly less likely to use their child care subsidies to purchase center care (as opposed to informal care). For example, Table 8 shows that families that never received cash with subsidies for a toddler and for another child are 100% less likely to enroll both in center care than in informal care. Table 8 also shows that if one of the two children for whom the family that never received cash assistance has subsidies is a toddler, the odds of placing them in two different types of care are 150% lower than the odds of placing them in informal care.

After controlling for all other variables in Table 1, as usual, we found that having at least one subsidized toddler has no significant impact on the child care choices of current and former cash recipient families with two child care subsidies (see Table 7).

*Families with Three Children in Subsidized Care*

Current and former cash recipient families with at least one toddler out of three subsidized children are significantly less likely to use their child care subsidies to get center care, and they are significantly more likely to purchase family child care for all three children than informal care. For example, Table 9 shows that current and former cash recipient families with subsidies for one toddler and for two other children are 67% less likely to enroll them in center care than in informal care, and they are 100% more likely to enroll all three in family child care than in informal care.

As can be seen in Table 10, after controlling for all variables in Table 1, as usual, the fact that the family's three child care subsidies are for one or more toddlers has no significant impact on the child care choices of families that never received cash.

***Impact of Having One or More Preschoolers in Subsidized Care***

*Families with One Child in Subsidized Care*

As can be seen in Table 5 and 6, we found no significant impact on the child care choices of either current and former cash recipients or families that never received cash as a result of the fact that the subsidy was for a child of preschool age (i.e., age 3 to kindergarten).

*Families with Two Children in Subsidized Care*

Controlling for all other variables in Table 1, current and former cash recipient families with two children in subsidized care, one or both of whom are of preschool age, are significantly more likely to use their child care subsidies to purchase center care for

both children rather than informal care. For example, Table 7 shows that current and former cash recipient families with subsidies for a preschooler and for a child in a different age range are 50% more likely to enroll both in center care than in informal care.

As can be seen in Table 8, the fact that the family's two child care subsidies are for at least one preschooler has no significant impact on the child care choices of families that never received cash.

#### *Families with Three Children in Subsidized Care*

Current and former cash recipients families with at least one preschooler out of three subsidized children are significantly more likely to use their child care subsidies to purchase family child care for all three than to purchase informal care for them. For example, Table 9 shows that current and former cash recipient families with subsidies for one preschooler and for two children in a different age range are 67% more likely to enroll all three in family child care than in informal care.

As can be seen in Table 10, the fact that the family's three child care subsidies are for one or more preschoolers has no significant impact on the child care choices of families that never received cash.

#### ***Impact of Having One or More Kindergarteners in Subsidized Care***

##### *Families with One Child in Subsidized Care*

Families that never received cash with a child care subsidy for a kindergarten-age child are significantly more likely to use it to purchase center care than to purchase informal care. Specifically, Table 6 shows that families that never received cash with a subsidy for a kindergartener are 100% more likely to enroll the child in center care than in informal care. The choice of center care over informal care is of borderline



significance (p-value=.06) for current and former cash recipients families with a subsidy for a kindergarten-age child.

*Families with Two Children in Subsidized Care*

Current and former cash recipient families with two children in subsidized care, one or both of whom are in kindergarten, are significantly more likely to use their child care subsidies to purchase center care for both children rather than informal care. For example, Table 7 shows that current and former cash recipient families with subsidies for a kindergartener and for a child in another age range are 50% more likely to enroll both children in center care than in informal care.

As can be seen in Table 8, for families that never received cash with two subsidized children, the fact that the family's two child care subsidies are for one or more kindergarten-eligible children has no significant additional impact on the family's child care choices, after controlling for all the other variables listed in Table 1.

*Families with Three Children in Subsidized Care*

Families that never received cash with three children in subsidized care, one or more of whom are of age to be in kindergarten, are significantly more likely to place their children in different types of care rather than to place all three in informal care. Specifically, Table 10 shows that families that never received cash with subsidies for one child of kindergarten age and for two children in other age ranges are 2.67 times more likely to enroll the three children in different types of care than in informal care. In contrast, as can be seen in Table 9, current and former cash recipient families with three children in subsidized care, one or more of whom are kindergarten eligible age-wise, are less likely to select different types of care for all three, relative to informal care, and

they are more likely to select family child care rather than informal care for all three. But these results are only marginally significant ( $p$ -value=.08).

### **Results: Impact of Community (Township) Factors**

For all the factors discussed in this section, except the availability of care and education variables, we report the impact of a unit change (increase or decrease) in the variable on the odds of using formal care (i.e., center or family) versus informal care. For availability of care and education variables, we report the impact of a standard deviation change (increase or decrease) in the variable on the odds of choosing formal versus informal care. We do this to avoid making “out of sample” predictions (i.e., predicting for values that we do not observe in the data). Such predictions are not statistically reliable because they represent situations that are not observed in the data. For ease of interpretation, we provide standard deviations of the availability variables in parentheses under the values associated with the estimated impact of the change.

#### ***Impact of Availability of Care and Education***

We found that the level of availability of full-day (FD) and part-day (PD) Head Start and kindergarten in AY 1998-1999 and the level of availability of formal care (i.e., preschool center care, family child care or school-age care) in 1998 had limited impact on the type of care chosen by families with child care subsidies. We suspect that this limited effect is due to the need, in order to avoid endogeneity, to use measures of availability only for the period at the beginning of our study. In the case of preschool center care, family child care and school-age care, this period was prior to the large expansion in availability of care associated with the provider reimbursement rate increases of 1999 through 2002. As we have shown previously in the Starting Right evaluation, these reimbursement rate increases were associated with large increases in

the availability of formal care and greater willingness on the part of providers to serve subsidized children.

### **Impact of Head Start Availability**

#### *Families with One Child in Subsidized Care*

Tables 5 and 6, in the section titled “Availability of Care and Education,” provide estimates of the impact of greater or lesser availability of Head Start on the choice of formal rather than informal care for families with one child care subsidy. As can be seen in Table 5, increased availability of FD Head Start significantly increases the odds that current and former cash recipient families will use their child care subsidy to enroll their Head-Start-eligible child in center care (as opposed to informal). Specifically, we estimate that, holding all of the factors listed in Table 1 constant, current and former cash recipient families with a child care subsidy for a child eligible for either regular Head Start or Early Head Start living in townships where FD Head Start served one standard deviation more eligible children than the average in AY 1998-99 (i.e., townships where FD Head Start served 34% of eligible children rather than the average of 21%)<sup>27</sup> are 13% more likely to use their child care subsidy to get center care rather than informal care for their child. As per results in Table 6, we find that the availability of Head Start has no significant impact on the child care choices of families that never received cash with one subsidized child.

#### *Families with Two Children in Subsidized Care*

Table 7 shows that current and former cash recipient families with two child care subsidies living in townships where PD Head Start served one standard deviation more eligible children than the average in AY 1998\_99 (i.e., townships where PD Head Start

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<sup>27</sup> Note that the average values used in this section differ from the means reported in Table 3. The reason is that the numbers in Table 3 are simple means across townships, while the means used in this section are weighted by the number of families receiving child care subsidies in the township.

served 39% of eligible children rather than the average of 27%) are 11% more likely to use their two subsidies to purchase center care rather than informal care for their Head Start eligible children. As per Table 8, again, the availability of Head Start has no significant impact on the child care choices of families that never received cash with two child care subsidies, after controlling for all other factors in Table 1.

*Families with Three Children in Subsidized Care*

We find no significant impacts of the availability of Head Start for families with three subsidized children.

**Impact of Kindergarten Availability**

*Families with One Child in Subsidized Care*

Table 5 shows that increased community availability of FD kindergarten significantly increases the odds that current and former cash recipients families with one child care subsidy will use it to place their 5-year-old child in center care rather than in informal care. Current and former cash recipient families living in townships where FD kindergarten served one standard deviation more eligible children than the average in AY 1998-99 (i.e., 29% of eligible children, rather than the average of 21%) are 7% more likely to use their child care subsidy to purchase center care rather than informal care for their 5 year old. We find no other significant impact for the availability of PD or FD kindergarten on child care choices.

*Families with Two Children in Subsidized Care*

For families with two subsidized children, no significant effects were found of kindergarten availability in AY 1998-99 on child care choices, after controlling for the variables in Table 1.

*Families with Three Children in Subsidized Care*

Tables 9 and 10 show that current and former cash recipients and families that never received cash residing in townships where PD kindergarten served one standard deviation more eligible children than the average in AY 1998-99 (i.e., 69% of eligible children, rather than the average of 60%) are 12% (current and former cash recipient families) and 19% (families that never received cash) less likely to use their three child care subsidies to purchase center care rather than informal care for all three children, one or more of whom are kindergarten eligible.

### **Impact of Availability of Preschool Center Care**

#### *Families with One Child in Subsidized Care*

For families with median characteristics whose subsidized child is a preschooler, we estimated the impact of increased availability of preschool center care on the type of care chosen by the family. These estimates hold the availability of family child care at the median level. We found that as the number of full-time preschool center slots per 100 children under age 5 in 1998 in the township increases, the odds that current and former cash recipients and families that never received cash with one child care subsidy would use it to purchase center care increase significantly, and the odds of using their subsidy to purchase family child care decrease significantly.

Specifically, for current and former cash recipient families with median characteristics and one subsidized child of preschool age, we estimate that, as the availability of preschool center care increases from 0 to 10 slots per 100 children under age 5, the probability that the family will choose center care increases from 76% to 79% and the probability that the family will choose family child care decreases from 20% to 14%. As the availability of preschool center care increases from 10 to 15 slots per 100 kids, the odds of selecting center care increase from 79% to 81% and the odds of

selecting family child care decrease from 14% to 11%. A further township increase in center availability from 15 to 20 slots per 100 children of preschool age further raises the probability that parents will choose center care from 81% to 83% and further decreases the odds of choosing family child care from 11% to 9%. Increasing center availability still more, from 20 to 25 slots per 100 preschool-age kids, increases the odds of choosing center care from 83% to 85% and further decreases the chances of choosing family child care from 9% to 8%. Still another increase in availability from 25 to 30 slots per 100 children results in an increase in the probability of choosing center care from 85% to 87% and causes the probability of choosing family child care to decrease from 8% to 6%. And so on. At an availability level of 50 slots per 100 children under age 5, we estimate the probability of choosing center care at 91% and the probability of choosing family child care at 3%.<sup>28</sup> The probability that the median current and former cash recipient family will choose informal care remains at approximately 7% regardless of the availability of center care.

For families that never received cash with median characteristics and one subsidized child of preschool age, we estimate that as the availability of preschool care increases from 0 to 10 slots per 100 children under age 5, the probability that the family will choose center care increases from 80% to 85%, the probability of choosing family child care decreases from 9% to 7% and the probability of choosing informal care decreases from 11% to 8%. As the availability of preschool center care increases from 10 to 15 slots per 100 kids, the odds of selecting center care increase from 85% to 87%, the odds of selecting family child care decrease from 7% to 6% and the odds of using informal care decrease from 7% to 6%. A further township increase in center

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<sup>28</sup> It should be noted that the variables related to availability of preschool care in Tables 5 and 6 are not significant when tested individually due to collinearity. But they are significant when tested together, as we did in our predictions.

availability from 15 to 20 slots per 100 children of preschool age would further raise the probability that parents will choose center care from 87% to 88% and would further decrease the odds of choosing family child care from 6% to 5% and of choosing informal care from 7% to 6%. And so on. At an availability level of 50 slots per 100 children under age 5, we estimate the probability of choosing center care at 96%, the probability of choosing family child care at 2% and the probability of choosing informal care at 2%.

#### *Families with Two Children in Subsidized Care*

For families with two child care subsidies and children of preschool age, we estimated the impact of increased availability of preschool center care on the type of care chosen by the family. We found that as the township number of full-time preschool center slots per 100 children under age 5 increases, the odds that families that never received cash with preschoolers and two child care subsidies would use them to purchase center care increase significantly, and the odds of using them to purchase family child care or informal care decrease significantly.<sup>29</sup> (Results are similar for current and former cash recipient families, but they are only marginally significant.) Specifically, for families that never received cash with median characteristics, two child care subsidies and preschool-age children, we estimate that, as the township availability of preschool center care increases from 0 to 10 slots per 100 children under age 5, the probability that the family will choose center care for both children increases from 51% to 59%, the probability that the family will choose family child care for both children decreases from 12% to 5%, and the chances that the family will choose informal care

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<sup>29</sup> It should be noted that the variables related to availability of preschool care for families with two child care subsidies, as reported in Tables 7 and 8 are not significant when tested individually due to collinearity. But, for Families that never received cash, they are significant when tested together, as we did in our predictions.

for both decrease from 37% to 35%. As the availability of preschool center care increases from 10 to 15 slots per 100 children, the odds of selecting center care for both children increase from 59% to 62%, the odds of selecting family child care for both decrease from 5% to 3%, and the odds of selecting informal care for both decrease from 35% to 33%. A further township increase in preschool center availability from 15 to 20 slots per 100 children of preschool age further raises the probability that parents will choose center care from 62% to 65% and further decreases the odds of choosing family child care from 3% to 2% and of choosing informal care from 33% to 32%. Increasing preschool center availability from 20 to 25 slots per 100 children increases the odds of choosing center care from 65% to 68% and further decreases the chances of choosing family child care from 2% to 1% and of choosing informal care from 32% to 30%. Still another increase in preschool center availability from 25 to 30 slots per 100 results in an increase in the probability of choosing center care from 68% to 70% and causes the probability of choosing family child care to decrease from 1.4% to 0.9% and of choosing informal care from 30% to 28%. And so on. At a preschool center availability level of 50 slots per 100 children under age 5, we estimate the probability of choosing center care at 79%, the probability of choosing family child care at .1%, and the probability of choosing informal care at 20%.

#### *Families with Three Children in Subsidized Care*

For families with three child care subsidies for preschool children, we estimated the impact of increased availability of preschool center care on the type of care chosen by the family. We found that as the township number of full-time preschool center slots per 100 children under age 5 increases, the odds that current and former cash recipient families with three child care subsidies would use them to purchase center care for their



subsidized preschool children increase significantly and the odds of using the subsidies to purchase informal care decrease significantly.<sup>30</sup>

Specifically, for current and former cash recipient families with median characteristics and three child care subsidies for preschool children, we estimate that, as the township availability of preschool care increases from 0 to 10 slots per 100 children under age 5, the probability that the family will choose center care for all three children increases from 85% to 88% and the probability that the family will choose informal care decreases from 12% to 8%. As the availability of preschool center care increases from 10 to 15 slots per 100 kids, the odds of selecting center care increase from 88% to 89% and the odds of selecting informal care decrease from 8% to 7%. A further township increase in center availability from 15 to 20 slots per 100 children of preschool age further raises the probability that parents will choose center care from 89% to 90% and further decreases the odds of choosing informal care from 7% to 6%. Increasing center availability from 20 to 25 slots per 100 kids increases the odds of choosing center care from 90% to 91% and further decreases the chances of choosing informal care from 6% to 5%. Still another increase in preschool center availability from 25 to 30 slots per 100 results in an increase in the probability of choosing center care from 91% to 92% and causes the probability of choosing informal care to decrease from 5% to 4%. And so on. At a preschool center availability level of 50 slots per 100 children under age 5, we estimate the probability of choosing center care for all three children at 92% and the probability of choosing informal care for all three at 2%.

### **Impact of Availability of School-Age Care**

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<sup>30</sup> It should be noted that the variables related to availability of preschool care for current and former recipient families with three child care subsidies, as reported in Table 9, are not consistently significant when tested individually due to collinearity. But for such families, they are significant when tested together, as we did in our predictions.

### *Families with One Child in Subsidized Care*

For families with one subsidized child, no significant effects were found of the availability of school-age care on child care choices, after controlling for the variables in Table 1.

### *Families with Two Children in Subsidized Care*

For median families with two child care subsidies for school-age children, we estimated the impact of increased availability of school-age care on the type of care chosen by the family. The level of both center and family child care were set at the median. We find that as the township number of full-time preschool center slots per 100 school-age children increases, the odds that the typical current and former cash recipient family with two child care subsidies and school-age children would use them to purchase center care for their two subsidized children increase significantly, and the odds of using them to purchase family child care or informal care decrease significantly.<sup>31</sup>

Specifically, for a current and former cash recipient family with median characteristics and two school-age children receiving child care subsidies, we estimate that, as the availability of school-age center care increases from 0 to 5 slots per 100 school-age children, the probability that the family will choose center care for both children increases from 60% to 68%, the probability that the family will choose family child care for both children decreases from 9% to 8%, and the probability that the family will choose informal care for both decreases from 26% to 20%. As the availability of school-age center care increases from 5 to 10 slots per 100 school-age

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<sup>31</sup> It should be noted that the variables related to school-age availability of care for current and former recipient families with 2 child care subsidies, as reported in Table 7 are not consistently significant when tested individually due to collinearity. But, for current and former recipient families, they are significant when tested together, as we did in our predictions.

children, the odds of selecting center care increase from 68% to 74%, the odds of selecting family child care decrease from 8% to 7%, and the odds of selecting informal care decrease from 20% to 15%.

*Families with Three Children in Subsidized Care*

For median families with three child care subsidies for school-age children, we estimated the impact of increased availability of school-age care on the type of care chosen by the family. For current and former cash recipient families, we found no significant impact for the increased availability of school-age care. For families that never received cash, results were too fragile to be used.

**Impact of Availability of Family Child Care**

*Families with One Child in Subsidized Care*

For families with one subsidized child, no significant effects were found of the availability of family child care on child care choices, after controlling for the variables in Table 1.

*Families with Two Children in Subsidized Care*

We find, as can be seen in Table 8, that families that never received cash with two child care subsidies and children ages 0-13 residing in townships where there was one standard deviation more family child care available in 1998 than in the average township (i.e., 6 family child care slots per 100 children ages 0-13, rather than 3 slots)<sup>32</sup> are over three times more likely to use their child care subsidies to purchase two types of care for their children rather than informal care for both.

*Families with Three Children in Subsidized Care*

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<sup>32</sup> Note that the mean number used here differs from the means reported in Table 3. The reason is that the numbers in Table 3 are simple means across townships, while the mean used in this section has been weighted by the number of families receiving child care subsidies in the township.

For families with three subsidized children, no significant effects were found of the availability of family child care on child care choices, after controlling for the variables in Table 1.

### **Impact of Public School Being in Session**

#### *Families with One Child in Subsidized Care*

For families with one subsidized child, no significant effects were found of public school being in session on child care choices, after controlling for the variables in Table 1.

#### *Families with Two Children in Subsidized Care*

Current and former cash recipient families with two child care subsidies are significantly less likely to use them to purchase center care (as opposed to informal care) for their school-age children during the months that public school is in session. Specifically, according to results in Table 7, for current and former cash recipient families with two children with subsidies, the odds of choosing center care for both school-age children during the months that public school is in session are 21% lower than the odds of choosing informal care.

#### *Families with Three Children in Subsidized Care*

As reported in Table 9 and consistent with the results discussed above for current and former cash recipient families with two children in subsidized care, current and former cash recipient families with three child care subsidies are also significantly less likely to use their subsidies to purchase center care (as opposed to informal care) for their public school-eligible children during the months that public school is in session. Specifically, for current and former cash recipient families with three children, the odds of choosing center care for all three school-age children during the months that public

school is in session are 36% lower than the odds of choosing informal care. For current and former cash recipient families with three child care subsidies, the odds of choosing different types of care for their three children are also significantly lower (57% lower) than the odds of choosing informal care for all three during the months that public school is in session.

### **Results: Impact of Continuity of Care and Education**

We find that our measure of the continuity of early care and education (i.e., the average quarterly staff turnover at child care centers in the township of residence in 1999) had no significant impact on the child care choices of families with one, two, or three child care subsidies (after controlling for all other variables in Table 1).

### **Results: Impact of Local Labor Market Conditions**

#### *Families with One Child in Subsidized Care*

We find that our measures of local labor market conditions (i.e., the percent of families in the township in odd-hour jobs and the monthly increase/decrease in the employment rate) had no significant impact on the child care choices of families with one child in subsidized care.

#### *Families with Two Children in Subsidized Care*

Results in Table 8 indicate that for every 1% increase in the monthly employment rate in the township of residence, families that never received cash with two child care subsidies show an increase of 9% in the odds of using family child care for both children rather than informal care.

#### *Families with Three Children in Subsidized Care*

Results in Table 9 show that for every 1% increase in the monthly employment rate in their township of residence, current and former cash recipient families with three

child care subsidies (similar to families that never received cash with two subsidies) show an increase of 13% in the odds of using family child care for their three children rather than informal care.

Results in Table 10 indicate that for every 1% increase in the percent of families in the township holding odd-hour jobs, we observe, among families that never received cash with three child care subsidies, a 45% increase in the likelihood of using center care rather than informal care and a 47% increase in the odds of using family child care (relative to using informal care) for their children. This somewhat unexpected result may reflect the availability of formal care at odd-hours in communities with large employers (e.g., airports, hospitals) that require odd-hour work.

### **Results: Impact of Other Community Factors**

We find limited impacts (after controlling for other factors) from the binaries set up to represent the various townships of residence of the current and former cash recipient families and families that never received cash in our study and from the Census 2000 variables describing various aspects of the townships (i.e., percent of the population living in poverty, percent of employed mothers with children under the age of 6, percent of families living in the same residence between 1995 and 2000, percent of workers using public transportation and percent of car owners among residents of driving age).

#### **Impact of Township of Residence**

##### *Families with One Child in Subsidized Care*

Results in Table 5 indicate that, for current and former cash recipient families with one child care subsidy, residence in Central Falls or Newport, as compared to the Balance of the State, is associated with significantly lower odds (94% to 97% lower) of

enrolling their children in family child care, relative to informal care. Results in Table 6 indicate that families that never received cash with one child care subsidy who are residing in Woonsocket, as compared to the Balance of the State, are significantly more likely (43 times more likely) to use their subsidy to purchase family child care than informal care.

*Families with Two Children in Subsidized Care*

For families with two children in subsidized care, no significant effects were found of township of residence on child care choices, after controlling for the other factors in Table 1.

*Families with Three Children in Subsidized Care*

For families with three children in subsidized care, no significant effects were found of township of residence on child care choices, after controlling for the other factors in Table 1.

**Impact of Median Family Income and Poverty Level**

*Families with One Child in Subsidized Care*

Results in Table 6 indicate that for every 1% increase in the percent of families in living in poverty in the residential township, there is, among families that never received cash with one child care subsidy, a 28% decrease in the odds that they will use their subsidy to buy family child care rather than informal care.

*Families with Two Children in Subsidized Care*

For families with two children in subsidized care, no significant effects were found of the township poverty level on child care choices, after controlling for the other factors in Table 1.

*Families with Three Children in Subsidized Care*

Results in Table 9 indicate that for every \$1,000 increase in the residential township median family income, there is, among current and former cash recipient families with three child care subsidies, a 30% decrease in the odds of using family child care for all three children, compared to informal care. We are not sure why this is so. Possibly it may be that, as the neighborhood median income increases, formal providers in the community become somewhat less eager to recruit as many subsidized clients as in communities where the median income is lower.

Table 10 shows that for every \$1,000 increase in the median family income in the township of residence, there is, among families that never received cash with three child care subsidies, a 20% decrease in the odds of placing the children in different types of care rather than placing all three in informal care. Reasons for this increased reliance on informal care are unclear, but they may be the same as suggested above.

### **Impact of Use of Public Transportation**

#### *Families with One Child in Subsidized Care*

We find (see Table 5) that for every 1% increase in the use of public transportation among workers in the township of residence, current and former cash recipient families with one child care subsidy are 32% less likely to enroll their child in center care than in informal care. One possible hypothesis for this behavior may be that when there is higher reliance on public transportation in the neighborhood, it may be harder or too costly for family members of subsidized children (who may work far away from home) to arrange to get the children to and from center facilities after opening time or before closing time.

We find, as reported in Table 6, that for every 1% increase in the use of public transportation among workers in the township of residence, families that never received



cash with one child care subsidy are over two times more likely to use their subsidy to buy family child care rather than informal care. Perhaps families without reliable means of transportation in their informal network find it easier to rely on neighborhood family child care providers who may be more flexible in their schedules than center facilities.

#### *Families with Two Children in Subsidized Care*

We find (see Table 8) that for every 1% increase in the use of public transportation among workers in the township of residence, families that never received cash with two child care subsidies are 59% less likely to enroll their two subsidized children in center care rather than in informal care. As noted above, the reason for increased avoidance of center care as reliance on public transportation increases may be related to the difficulties of getting reliable and affordable transportation to get the children to and from a center facility while the parents are away at work.

#### *Families with Three Children in Subsidized Care*

Results reported in Table 10 indicate that, for every 1% increase in the use of public transportation among workers in the township of residence, families that never received cash with three child care subsidies are more than 15 times more likely to enroll their three children in family child care than in informal care. As we have noted above, this may be indicative of transportation problems during the day, which families that never received cash may solve by relying on more flexible family child care providers.

### **Impact of Car Ownership**

#### *Families with One Child in Subsidized Care*

We find that the higher the proportion of car owners among residents of driving age in the township, the lower the use of center care or family child care (relative to

informal care) among current and former cash recipient families with one child care subsidy. Table 5 shows that, for every 1% increase in car ownership in the township of residence, there is a 9% decrease in the use of center care and a 13% decrease in the use of family child care (relative to informal care) among current and former cash recipient families with one child care subsidy. We are not sure why this is so. As previously noted, it may be that, in communities with higher car ownership levels (generally these are communities with higher median incomes), formal providers are somewhat less active in recruiting as many clients with child care subsidies as in communities where the median income and car ownership levels are lower.

*Families with Two Children in Subsidized Care*

For families with two children in subsidized care, no significant effects were found of the township level of car ownership on child care choices, after controlling for the other factors in Table 1.

*Families with Three Children in Subsidized Care*

For families with three children in subsidized care, no significant effects were found of the township level of car ownership on child care choices, after controlling for the other factors in Table 1.

## **8. CONCLUSIONS**

We summarize our study and findings in greater detail in the Executive Summary at the beginning of this report. In this section we provide a very brief summary of our major findings regarding each of the major questions posed in the Executive Summary. We also provide in this section our recommendations for future research.

***Question 1: What were the impacts of RI's extensive reform of the policies and administrative procedures governing the child care subsidy program on child care choices made by subsidized families?***

Our findings indicate that RI's expansions of both income eligibility and age eligibility for child care subsidies in January 1999 and July 1999 and RI's increases in the reimbursement rates for formal providers in January 1999, July 1999, and particularly the large increases in January 2000 led to significant increases in the likelihood that both current and former cash assistance families and families that never received cash assistance would choose formal care rather than informal care for their children receiving child care subsidies.

Our findings also indicate that the establishment of RI's Comprehensive Child Care Services program in April 2001, RI's stricter enforcement of requirements for informal providers beginning in mid-June 2001 and RI's separation of eligibility determination for child care subsidies from enrollment with a given provider, initiation of web-based enrollment, and establishment of portable vouchers also in mid-June 2001 led to a second round of significant increases in the likelihood that current and former cash recipients and families that never received cash would choose formal care rather than informal care for their subsidized children (see Figures 13 through 21 in Appendix B).

***Question 2: How do household characteristics affect the child care choices of families with child care subsidies?***

The age of the head of household, the age of the children receiving child care subsidies, the percent of children of various ages in the household and the race/ethnicity, citizenship status and education of the household head significantly affect

the child care choices of families with child care subsidies. We find the strongest and most consistently significant results for variables related to the age of the household head and to the ages of the subsidized children.

To be more specific, we find that the probability of choosing center care peaks when the head of household is in her early to mid 30s, holding all other factors in Table 1 constant. We also find that as the ages of the oldest and youngest children increase, the likelihood that the family will choose family child care or different types of care declines. However, if the youngest child in a household is an infant, the household is significantly more likely to use informal care or family child care, rather than center care. We find that Hispanic current and former cash recipient families with one, two or three child care subsidies are significantly more likely to choose informal care than center care. But Hispanic families that never received cash are not significantly more likely to choose informal care than center care. In general, we find that better educated households are more likely to choose formal care than less well educated households. Households headed persons who are not U.S. citizens are more likely to choose family child care than households headed by U.S. citizens.

***Question 3: What impact do community characteristics have on child care choices?***

We find that increased availability of Head Start, kindergarten and, particularly, center care for preschoolers significantly increases the probability that households will choose center care. We also find that the transportation options available to the family significantly impact child care choices.

***Question 4: Do households with two children in subsidized care and with three children in subsidized care behave differently than households with only one child receiving child care subsidies?***

We find strong evidence, presented throughout this document, that families with one child care subsidy make significantly different care choices than families with two subsidies. We also provide strong evidence that families with two subsidies make significantly different child care choices than families with three subsidies.

***Implications for Future Research***

We believe that our findings have a number of important implications for future research. We detail what we believe to be the three most important implications. First, our research indicates that it is important to control for the ages of all children, not just the youngest child, and to control for the age structure of the household when studying child care choices. To date most work on child care choices has controlled only for the age of the youngest child, even if the family had more than one child receiving child care. Our work is only a beginning step toward incorporating more comprehensive representations of the ages of children in the household in child care choice models. Our data allowed us to consider only the ages of subsidized children. An important next step would be to consider the ages of all the children in the household, whether subsidized or unsubsidized.

Second, our research suggests that more work needs to be done on the way in which the availability of various types of care and education (e.g., center care, school-based care, kindergarten, Head Start and family child care) interact and relate to child care choices. This work may have to be largely descriptive and/or may have to use different methodologies than the methodology used in this paper.

Third, we believe that our research demonstrates clearly that the child care choices of different types of households are quite different. To be more specific, the factors impacting the child care choices of current and former current and former cash recipient households are substantially different than the factors impacting the child care choices of families that have not received cash assistance (i.e., families that never received cash). For example, our results indicate that families that never received cash react to changes in child care subsidy policy only with a lag, while current and former cash recipient families react very quickly. We also find that the child care choices of families with a single child in care, with two children in care and with three children in care are all quite distinct. For example, we find that families with more than one child in care rarely choose to place one child in one type of care and another child in a different type of care. Families show strong preferences for placing all of their children in a single form of care.

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## **Appendix A**

### **Reform of Rhode Island's Child Care Subsidy Program**

In this section we first describe RI's child care subsidy program prior to reform and then we discuss the changes in policies that occurred as part of the reform program.

#### ***The Child Care Subsidy Program Prior to Reform***

Prior to reform, RI's child care subsidy program, like the child care subsidy programs in many other states, was highly fragmented and gave preferential treatment for child care subsidies to cash assistance recipients. Cash assistance recipients were entitled to child care subsidies if they were working or participating in the JOBS program. Under the Transitional Child Care program (TCC), working former cash recipients were also entitled to receive child care subsidies for one year after leaving cash assistance. After the transitional year, former cash assistance families could receive child care subsidies if funds were available under the Child Care and Development Block Grant (CCDBG). Other families with incomes below 185% of the Federal Poverty Level (FPL) were also eligible for child care subsidies under CCDBG, but they only received subsidies if funds were available.<sup>33</sup>

#### ***Policy Changes as a Result of the Reforms***

In May 1997, as part of its welfare reform, RI made child care subsidies an entitlement for all families with incomes below 185% of the Federal Poverty Level (FPL). This major reform guaranteed availability of subsidized child care to all eligible low-income families, regardless of whether or not they were receiving cash assistance. RI guaranteed child care subsidies in spite of the fact that the federal government and all

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<sup>33</sup> Although there was no entitlement to CCDBG child care, RI was able to serve all families that applied. The State did not have a waiting list during our study period.



other states provided no such guarantees.<sup>34</sup> Under federal regulations, child care subsidies are available only to the extent that funds are available. In deciding to guarantee child care, RI made the decision to provide State funding when federal funding was not sufficient to serve all eligible families.

In January 1998, for the first time since August 1994, the State increased the rates it paid to formal child care providers (called reimbursement rates) under the child care subsidy program. The increase in reimbursement rates for full-time child care ranged from 12% (for infant and toddler care in family child care homes) to 22% (for preschool care in family child care homes). Rates for informal care were not changed.

The major reform of the child care subsidy program, Starting R<sup>I</sup>ght, began in January 1999. Under this program the State increased from 185% to 200% of the FPL the maximum income that families could receive to be eligible for child care subsidies, and it increased from 12 to 14 years the maximum child age to qualify for child care subsidies.

In January 1999, the State also increased provider reimbursement rates. Reimbursement rates for formal child care providers were increased between 4% (for before-school care) and 14% (for care of a preschooler in family child care homes). Rates for informal care were not increased.

A second wave of child care policy changes occurred in July 1999. At that time, the State increased from 200% to 225% of the FPL the maximum allowable family income to qualify for the child care subsidy entitlement, and it increased to 15 the maximum child age to receive a child care subsidy. Reimbursement rates for formal care were also increased in July 1999, with increases ranging from 7% (for infant and

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<sup>34</sup> Even before the recent economic downturn, most states had waiting lists for child care subsidies.

toddler care in family child care homes) to 13% (for preschool care in family child care homes).

In January 2000, Rhode Island implemented the State requirement that provider reimbursement rates be set at the 75<sup>th</sup> percentile of the most recently available survey of child care prices (known as a market rate survey).<sup>35</sup> The implementation of this requirement resulted in large increases in reimbursement rates, and it considerably increased for providers the attractiveness of participating in the child care subsidy program. The January 2000 rates were set at the 75<sup>th</sup> percentile of market prices found in the 1998 market rate survey. This resulted in rate increases ranging from 19% (for the care of infant and toddlers in family child care homes) to 78% (for the before-school care of school-age children in child care centers).<sup>36</sup> Once again, rates for informal care remained unchanged.

In April 2001, Rhode Island began enrolling 3- and 4-year-old children living in families with incomes below 108% of FPL in its Comprehensive Child Care Services Program (CCCSP). The CCCSP program was developed to expand access to comprehensive child care services to a growing number of un-served and under-served children in the State. This program provides comprehensive services to children in communities that are not well served by the Head Start program (e.g., Central Falls and Pawtucket). Income-eligible families and cash-assistance families were eligible for this program and were actively recruited by RI DHS. In addition to formal child care,

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<sup>35</sup> Federal regulations require that states reimbursement rates be set so as to provide "equal access" to care for subsidized children. States that set rates at the 75<sup>th</sup> percentile of prices found in a market rate survey not more than two years old are presumed to have provided equal access. Accordingly, the RI State Legislature requires that a market rate survey be conducted every two years and that rates be adjusted to reflect survey results.

<sup>36</sup> To give an example of provider reimbursement rates paid after the January 2000 increases, licensed centers were paid \$160 per week for infant/toddler care and \$140 per week for preschool care; certified family child care homes were paid \$125 per week for full-time care of infants, toddlers, and preschoolers; licensed before-school facilities were paid \$50 per week and licensed after-school facilities were paid \$67 per week.

comprehensive services that are provided include children's health, nutrition and safety programs, mental health services, support for children with disabilities and family education and empowerment programs. The programs also provide coordinated guidance and support for families with children entering kindergarten. The CCCSP was rolled out gradually and only approximately 260 children were enrolled in the program in early 2004.

Several important administrative policy changes were instituted on June 17, 2001, including de-linking family eligibility for a child care subsidy from enrollment with a specific provider, portable vouchers and a crack-down on informal providers not meeting subsidy standards. Specifically, provider approval was moved in house from the field, which may have had impact particularly on the approval of informal providers. Automated web-based enrollment was implemented as well as portable child care certificates. The program also began limiting the number of children an informal provider can care for to three (in accordance with RI's child care licensing laws), unless all children are strictly related to the provider. Perhaps the most significant policy change that became effective on June 17, 2001 was that prior to this date parents were required to enroll their children with a provider in order to be eligible for child care assistance. However, effective June 17, 2001 family eligibility was separated from enrollment with a provider so that a family could hold a valid child care certificate (CCAP) and not necessarily have the child enrolled in care at such time.

In January 2002 provider reimbursement rates were increased to the 75<sup>th</sup> percentile of the 2000 market rate survey. This resulted in rate increases of 8% for the care of infants and toddlers in centers and family child care homes and for the care of preschoolers in family child care homes. Rates for center care of preschoolers and

school-age children and youth remained as before and informal provider rates were not increased. In fact, it should be noted that the rates paid to informal providers stayed at the same level throughout our study period.

**Table 1**  
**Definition of Variables, Type of Variation and Sources**

<i>Variable Name</i>	<i>Variable Description &amp; Level of Observation</i>	<i>Type of Variation</i>	<i>Data Source</i>
<i>Dependent Variable</i>			
Choice(1child) Choice(2children) Choice(3children)	<b>Household</b> Choices depicted in Figures 1,2 and 3	Cross sectional & time series	RI child care subsidy files
<i>Explanatory Variables</i>			
<i>Socio-Demographic</i>			
hsgrad	binary=1 if <b>household</b> head has 12 years of education	Cross section & time series	RI child care subsidy files
morethanhs	binary=1 if <b>household</b> head has more than 12 years of education	Cross section & time series	RI child care subsidy files
zeroeduc	binary=1 if education of <b>household</b> head is missing	Cross section & time series	RI child care subsidy files
age	Age in years of <b>household</b> head	Cross section & time series	RI child care subsidy files
agesquared	Age (squared) of <b>household</b> head	Cross section & time series	RI child care subsidy files
agechild1 agechild2 agechild3	Age of child or children (up to 3) in <b>household</b>	Cross section & time series	RI child care subsidy files
%<age1	Percent of CC subsidized children under age 1 in <b>household</b>	Cross section & time series	RI child care subsidy files
%age1_2	Percent of CC subsidized children ages 1-2 in <b>household</b>	Cross section & time series	RI child care subsidy files
%age3_kinder	Percent of CC subsidized children ages 3 to kindergarten in <b>household</b>	Cross section & time series	RI child care subsidy files
%agekinder	Percent of CC subsidized children who are kindergarten eligible in <b>household</b>	Cross section & time series	RI child care subsidy files

<i>Variable Name</i>	<i>Variable Description &amp; Level of Observation</i>	<i>Type of Variation</i>	<i>Data Source</i>
numage13-16	number of CC subsidized children ages 13-16 in <b>household</b>	Cross section & time series	
2working	<b>Household</b> with two working adults	Cross section & time series	RI child care subsidy files
notcitizen	Head of <b>household</b> is not a US citizen	Cross section & time series	RI child care subsidy files
white	Head of <b>household</b> is white	Cross section & time series	RI child care subsidy files
black	Head of <b>household</b> is black	Cross section & time series	RI child care subsidy files
hispanic	Head of <b>household</b> is Hispanic (any race)	Cross section & time series	RI child care subsidy files
childsupport	Binary=1 if family ( <b>household</b> ) receives child support	Cross section & time series	RI child care subsidy files
mon_ccsub_5/96-6/98	Number of months family ( <b>household</b> ) on cash assistance (all spells between May 1996 and June 1998)	Cross section	RI cash assistance files
mon_FIP_5/96-6/98	Number of months family ( <b>household</b> ) on child care subsidies (May 1996 to June 1998)	Cross section	RI child care subsidy files
<b>Time Series</b>			
bin8_98 through bin6_02	Set of binary variables-one for each month except July 1998	time series	Created
<b>Availability of Care and Education</b>			
centerslotspertots98	Number of full-time preschool center slots per 100 children under age 5 in <b>township</b> in 1998	Cross section	RI Kids Count
Centeravail98	Interaction of: centerslotspertots98	Cross section & time series	RI child care subsidy files and RI

<i>Variable Name</i>	<i>Variable Description &amp; Level of Observation</i>	<i>Type of Variation</i>	<i>Data Source</i>
	<b>x</b> fraction of children under age 5 in <b>household</b>		RI child care subsidy files and RI Kids Count
saslotspertots98	Number of school-age center slots per 100 school-age children in <b>township</b> in 1998	Cross section	RI Kids Count
schageavail98	Interaction of: saslotspertots98 <b>x</b> fraction of school-age children in <b>household</b>	Cross section & time series	RI Kids Count
fcchslotspertots98	Number of family child care slots per 100 children ages 0-13 in <b>township</b> in 1998	Cross section	RI Kids Count
Hsavailpd	Interaction of: proportion of eligible children enrolled part-day in Early Head Start & Head Start in AY 98_99 in <b>township</b> <b>x</b> proportion of eligible children in <b>household</b>	Cross section & time series	RI Kids Count; Head Start Program Information Reports
Hsavailfd	Interaction of: proportion of eligible children enrolled full-day in Early Head Start & Head Start in AY 98_99 in <b>township</b> <b>x</b> proportion of eligible children in <b>household</b>	Cross section & time series	RI Kids Count; Head Start Program Information Reports
kinderavaildpdp	Interaction of: proportion of eligible children in part-day/part-year kindergarten in AY 98_99 in <b>township</b> <b>x</b> proportion of	Cross section & time series	RI Kids Count

<i>Variable Name</i>	<i>Variable Description &amp; Level of Observation</i>	<i>Type of Variation</i>	<i>Data Source</i>
	eligible children in <b>household</b>		
kinderavailfdpy	Interaction of: proportion of eligible children in full-day/part-year kindergarten in AY 98_99 in <b>township</b> <b>x</b> proportion of eligible children in <b>household</b>	Cross section & time series	RI Kids Count
schoolin	Binary=1 if elementary and secondary school are in session, zero if they are not in session in <b>township</b>	Cross section & time series	Rhode Island Department of Education
<b>Continuity of Care and Education</b>			
staffturnover99	Average quarterly staff turnover at cc centers in <b>township</b> in 1999	Cross section	Licensing lists & Unemployment Insurance earnings files
<b>Accessibility of Care and Education</b>			
centerssqmile	Number of full-time centers per square mile in <b>township</b> in 2000	Cross section	RI child care licensing lists
fcchsqmile	Number of family child care providers per square mile in <b>township</b> in 2000	Cross section	RI child care licensing lists
<b>Local Labor Market</b>			
empgrowth	Percent monthly employment change (+/- ) in the <b>township</b>	Cross section & time series	RI Department of Labor and Training LAUS files
%odhourjobs	Percent of <b>township</b> population leaving for work between 10 AM & 6 AM	Cross section	Census 2000



<i>Variable Name</i>	<i>Variable Description &amp; Level of Observation</i>	<i>Type of Variation</i>	<i>Data Source</i>
<b>Community Characteristics</b>			
CFalls Newport Pawtucket Providence WWarwick Woonsocket	Binaries for Household residence in specific townships when first observed on child care subsidies	Cross section	RI child care subsidy files
medfamilyincome	Median family income in <b>township</b>	Cross section	Census 2000
%poverty	Percent poverty in <b>township</b>	Cross section	Census 2000
%momwork	Labor force participation of mothers with children under age 6 in <b>township</b>	Cross section	Census 2000
%usepublictran	Percent of workers in <b>township</b> using public transportation	Cross Section	Census 2000
%carownership	Car owners as a percent of drivers age 16 & over in <b>township</b>	Cross section	Census 2000
%samehouse95_00	Percent of families living in the same residence 1995-2000 (proxy for stability of neighborhood) in <b>township</b>	Cross section	Census 2000

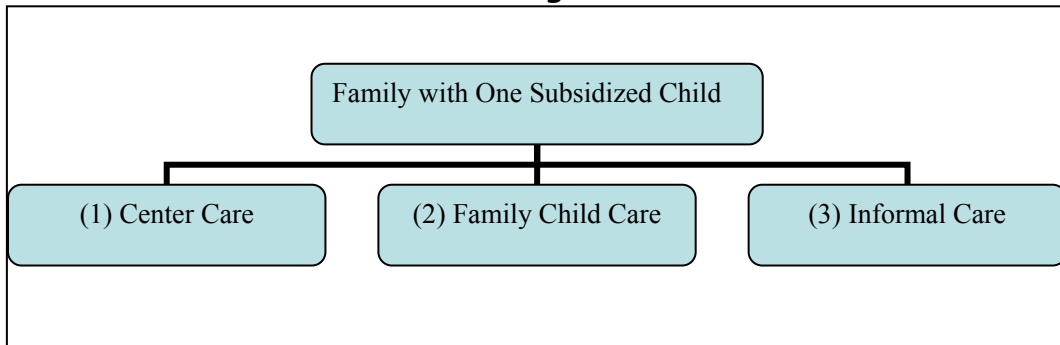
**Table 2**  
**Descriptive Statistics for Household Variables: Income Eligible Families Never on FIP and**  
**Current/Former FIP Families**  
**Study Period: July of 1998 to June of 2002**

<b>EXPLANATORY VARIABLES:</b>	No Cash Mean	C&F Cash Mean	P-Value SignDiff
<b><i>Socio-Demographic:</i></b>			
Percent of Household Heads with 12 Years of Education	36.70	50.54	0.0000
Age of Household Head	31.82	28.81	0.0000
Percent of Black Households	14.22	17.97	0.0000
Percent of Hispanic (any race) Households	31.85	27.51	0.0000
Percent of White non-Hispanic Households	53.17	53.65	0.0184
Number of Children in the Household Receiving Child Care Subsidies	1.52	1.63	0.0000
Age of Youngest Subsidized Child in the Household	4.52	4.15	0.0000
Percent of Subsidized Children in Household age less than 12 Months	5.55	5.16	0.0000
Percent of Subsidized Children in Household age 1 to 3	21.13	23.57	0.0000
Percent of Subsidized Children in Household ages 3 to 5—Not Kindergarten Eligible	28.53	31.12	0.0000
Percent of Subsidized Children in Household Eligible for Kindergarten	10.19	10.15	0.6118
Percent of Subsidized Children in Household of School Age	34.60	30.01	0.0000
Number of subsidized children in Household ages 13-16--Middle & Secondary School Age	0.02	0.01	0.0000
Percent of Households Receiving Child Support	13.21	5.16	0.0000
Percent of Households with Two Working Adults	5.01	3.55	0.0000
Head of Household Is Not a US Citizen	26.40	14.02	0.0000
Number of Months Family (Household) on FIP 5/96-6/98	0	13.26	0.0000
Number of Months Family (Household) Received Child Care Subsidies 5/96-6/98	7.27	6.27	0.0000
<b><i>Core Communities:</i></b>			
Percent of Households residing in Central Falls	3.83	4.22	0.0000
Percent of Households residing in Newport	1.81	3.75	0.0000
Percent of Households residing in Pawtucket	11.17	11.01	0.1499
Percent of Households residing in Providence	38.19	39.69	0.0000
Percent of Households residing in West Warwick	3.78	3.65	0.0532
Percent of Households residing in Woonsocket	3.25	5.64	0.0000

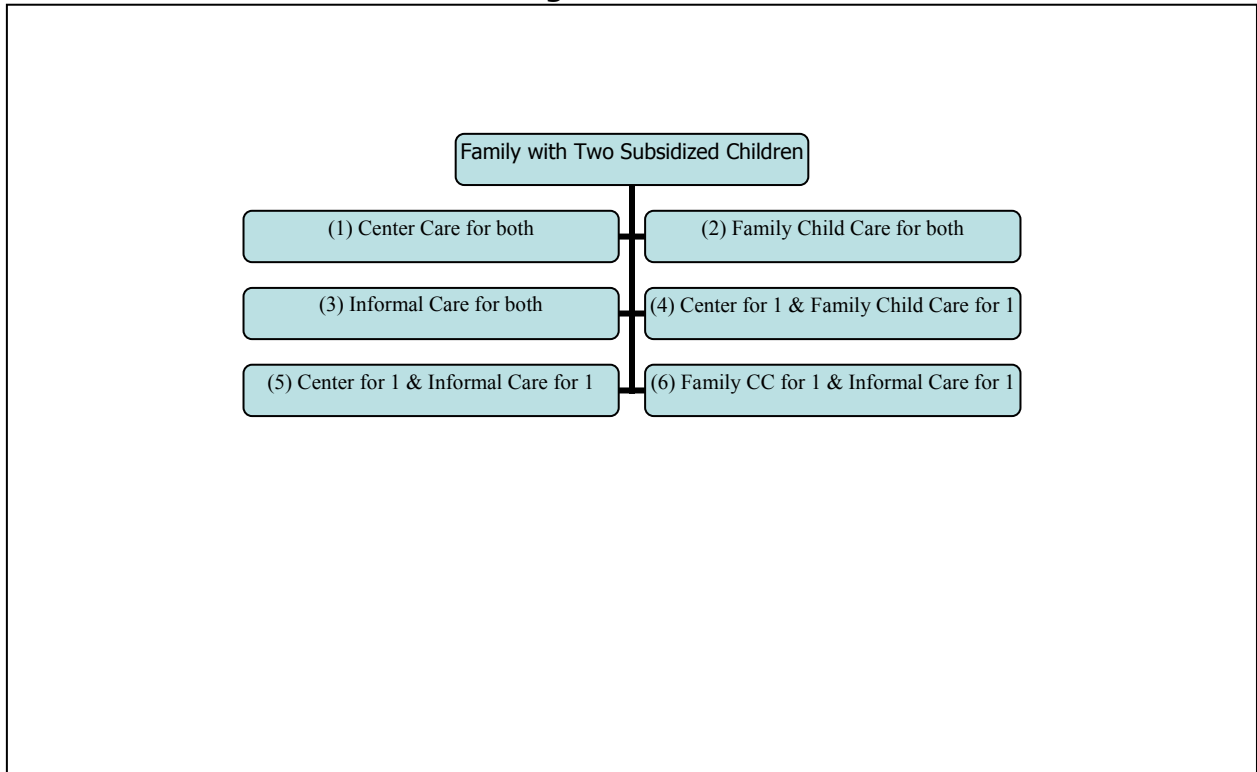
**Table 3**  
**Descriptive Statistics for Township Variables**  
**Study Period: July 1998 to June 2002**

<b>EXPLANATORY VARIABLES:</b>	Median	Mean	SD
<b><i>Availability of Care and Education:</i></b>			
Number of Full-Time Preschool Center Slots per 100 Children under age 5 in 1998	14.50	16.60	13.61
Number of School-Age Center Slots per 100 School-Age Children in 1998	7.00	8.92	9.80
Number of Family Child Care Slots per 100 Children ages 0-13 in 1998	2.00	1.92	1.08
Percent of Eligible 3-5 Year Olds Enrolled in Part-Day Head Start in 98-99	51.67	46.55	29.91
Percent of Eligible 0-3 Year Olds Enrolled in Part-Day Early Head Start in 1998-1999	0.00	1.50	2.92
Percent of Eligible 3-5 Year Olds Enrolled in Full-Day Head Start in 1998-1999	5.73	10.92	14.97
Percent of Eligible 0-3 Year Olds Enrolled in Full-Day Early Head Start in 98-99	0.00	3.50	7.29
Proportion of Eligible Children in Part-Day Kindergarten in 1998-1999	82.76	68.68	35.75
Proportion of Eligible Children in Full-Day Kindergarten in 1998-1999	0	8.17	22.16
<b><i>Accessibility of Care and Education</i></b>			
Number of Full-Time Centers per Square Mile in 2000	.42	1.69	4.60
Number of Family Child Care Homes per Square Mile in 2000	.46	4.47	16.37
<b><i>Continuity of Care</i></b>			
Quarterly Turnover Rate of Staff at CC Centers in 1999	13.34	13.36	4.66
<b><i>Local Labor Market Conditions:</i></b>			
Percent of Population Leaving for Work Between 10AM & 6AM	26.35	26.56	4.27
Monthly Percent Change in Number Employed	.29	.26	1.49
<b><i>Community Characteristics:</i></b>			
Family Income	\$51491	\$50,313	11539
Percent of Families in Poverty	5.30	7.85	6.35
Percent of Mother's with Children under age 6 in Work Force	68.10	66.99	7.53
Percent of Persons Over Age 16 that Own Cars	84.83	83.21	6.62
Percent of Workers Using Public Transportation	1.30	1.51	1.33
Percent of families Residing in Same House 1995-2000	61.91	61.08	7.36

**Figure 1**



**Figure 2**



**Figure 3**

