Matching Non-Parental Child Care Usage and Preferences by Race/Ethnicity: Is It Connected to Maternal Work Stability?

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INTRODUCTION

Increasing numbers of working women, particularly working mothers, represents a major demographic change. Women working full time rose from 33 percent in 1978 to 50 percent in 1998, and from 14 to 35 percent among mothers with children six years or younger (Cohen and Bianchi, 1999). Among married mothers, labor force participation rates increased from 35 percent in 1975 to 62 percent in 2000 for Whites, and from 55 to 78 percent for Blacks (U.S. Census Bureau, 2001).

Child care becomes a main concern as mothers, particularly poor welfare users with young children, increasingly enter the labor force. As a result, researchers and policy makers are examining potential outcomes of using non-maternal child care. Studies focus primarily on the positive and negative child care effects on children. These studies examine mother-child attachment bond problems, cognitive, social, emotional and human capital developmental outcomes, and the consequences of non-high quality child care use (Chase-Landale and Owen, 1987; Belsky and Rovine, 1988; Belsky, 1992; Ribar, 1992; Kimmel, 1995; Ribar, 1995; Kimmel, 1998; Burchinal *et al.*, 2000; Blau, 2001).

Although the child care literature is growing rapidly, fewer researchers have given attention to the effect on mothers. Child care utilization affects maternal time and thus mothers' multiple roles, as individuals, mothers, workers, and wives (Amato and Booth, 1997; Zaslow and Emig, 1997). Mothers who use non-maternal child care are more able to reallocate their time, and hence, they are more likely not only to be employed, but also to have more stable jobs and to have higher and more stable levels of emotional well-being. Higher financial and socio-emotional maternal stability have important implications on the entire family environment.

Not just availability issues, but also parental child care preference patterns, which are particularly diverse between different racial/ethnic groups, influence mothers' behaviors (Tienda and Glass, 1985; Kimmel, 1995; Fuller *et al.*, 1996; Harris, 1996; Uttal, 1999, Singer *et al.*, 1998; Early and Burchinal, 2001). White mothers prefer center-based arrangements, while Black and Hispanic mothers prefer family-based arrangements. These racial/ethnic differences remain even after income is controlled. Studies evidence that using child care arrangements suitable to mother's preferences increases both maternal psychological well-being and work stability (Mason and Duberstein, 1992; Ribar, 1992; Kisker and Ross, 1997; Fuller *et al.*, 2001; Peyson *et al.*, 2001). In addition, maternal satisfaction and stability determine the quality of the mother-child relationship, which mediates the association between non-maternal child care and child development outcomes (Clark *et al.*, 1997; Allhusen *et al.*, 2001).

Although some information is available on maternal child care preferences and their consequences on maternal work stability, little is known about the dynamics of child care use and maternal stability over time. This study uses the *Survey of Income and Program Participation (SIPP),* a longitudinal database that captures information on child care arrangement rotations, maternal working conditions and dynamics. This information is particularly important for examining not only how child care use and preferences affect maternal work and economic conditions, but also for analyzing how changes in child care usage affect mothers' work stability, and hence their children's developmental outcomes (Yoshikawa, 1999).

CONCEPTUAL FRAMEWORK

Potential effects of non-maternal child care use

The majority of studies evaluating the effect of non-maternal child care use focus on the impact on children's outcomes. These studies evidence that non-maternal child care has both positive and negative consequences on children's developmental outcomes. Among the negative effects, research shows that children using non-maternal child care have weaker attachment bonds with their mothers, especially those whose mothers start working soon after giving birth (Chase-Landale and Owen, 1987; Belsky and Rovine, 1988; Belsky, 1992; Clarke-Stewart, 1992; Allhusen *et al.*, 2001; Pesnew-Feinberg et al., 2001).[1] Positive effects are mostly associated with high-quality child care arrangement use. Studies find that high-quality arrangements improve children's cognitive, emotional and social developmental outcomes (Belsky, 1992; Clarke-Stewart, 1992; Burchinal *et al.*, 2000; Blau, 2001; Allhusen *et al.*, 2001; Pesnew-Feinberg et al., 2001).[2]

Although research shows that maternal influences play a major part in the development of children, only few studies explore non-parental child care effects on mothers. Economic research represents the majority of these studies. They mainly emphasize non-maternal child care effects on maternal labor market participation and human capital improvements. These factors positively affect, not only maternal income, but also mothers' economic independence

1 Also, children who experience extensive non-maternal child care have more unstable primary caregivers. Lacking stable child care providers not only prevents developing strong attachment bonds with the primary caregiver, but also weakens the mother-child bond (Waldfogel, 2000; Meyers, 2002).

2 High-quality arrangements have fewer children per caregiver; have lower levels of professionals and staff member turn over; have more skilled and sensitive workers, and have more educational materials. These characteristics lead to more stable primary caregivers and environments, where children benefit from cognitive enhancing atmospheres and socio-emotional stability. However, there is no clear consensus over the effect of non-high quality child care (Roggman et al., 1994; Blau, 1999).

and self-confidence,[3] and their emotional well-being. Indeed, non-maternal child care affects mothers' multiple roles. Amato and Booth (1997) find that maternal multiple and new roles' conflicts impact children's well-being. Using non-maternal child care gives mothers the opportunity to allocate more efficiently their time among work, child care and leisure, and thus determine their level of satisfaction and stability. Mothers with young children are the most affected, given that maternal time is more valuable the younger the child (Becker, 1965; Ribar, 1992; Ribar, 1995; Blau, 2001).[4]

Nevertheless, using non-maternal child care does not always lead to increases in maternal well-being. Studies show that mothers' preferences for certain types of child care arrangement moderate this effect. Factors such as income level (Kisker and Ross, 1997; Early and Burchinal, 2001), geographic location (Singer *et al.*, 1998), children's age (Singer *et al.*, 1998; Early and Burchinal, 2001; Fuller *et al.*, 2001; Smith, 2002), child care subsidy availability (Brewster and Padavic, 2002), information barriers to beneficial child care availability (Ronsaville and Hakin, 2000), and particularly racial/ethnic characteristics determine maternal use and preferences of certain child care arrangements (Tienda and Glass, 1985; Kimmel, 1995; Uttal, 1999, Singer *et al.*, 1998; Early and Burchinal, 2001). Finding arrangements sensitive to maternal preferences reduces fears related to unsafe child care settings, enhances maternal well-being and subsequently, children's development (Mason and Duberstein, 1992; Ribar, 1992; Kisker and Ross, 1997; Peyson *et al.*, 2001; Waldfogel, 2002). This is, maternal work improvements benefit children's development through larger family resources, as well as higher levels of maternal

3 This issue is particularly important for poverty and welfare dependence exits (Kisker and Ross, 1997).

4 Human capital theory assumes that young children are commodities that demand goods and time. However, they are time intensive, indeed, maternal time intensive (Becker, 1991).

human and social capital (Becker, 1965; Becker, 1993; Ribar, 1992; Kimmel, 1995; Ribar, 1995; Schultz, 1995; Kimmel, 1998; Blau, 2001). Also, employment increases maternal mental health, self-esteem and their role as positive adult models (Moore and Driscoll, 1997; Dunifon *et al.*, 2002). These findings suggest an important indirect effect of child care on children's development through maternal changes.

Child care quality, quantity and preferences

Although child care is widely studied, different disciplines emphasize different aspects. Developmental psychologists, for example, focus on *quality* features and children's developmental outcomes associated with child care use. Economists also consider quality characteristics of child care, however, their emphasis is on *quantity* aspects, such as child care supply and cost-related availability (Blau, 2001; Waldfogel, 2002). Independently, both quality and quantity features contribute to a better understanding of child care issues, but an integration of these two aspects could lead to more precise interpretations.

The majority of child care research examines the effect of child care *quality* characteristics on children's developmental outcomes. Studies indicate that high-quality child care settings have positive effects on children's development. They emphasize the beneficial effects on children's cognitive outcomes, socio-emotional development, and parent-child attachment bonds (Belsky, 1990; Belsky, 1992; Clarke-Stewart, 1992; Waldfogel, 2000; Blau, 2001; Allhusen *et al.*, 2001; Pesnew-Feinberg et al., 2001).[5] However, although parents

5 Nevertheless, the majority of these studies only analyze the short-term effect of high quality child care, when some studies show that this effect vanishes with time (Egeland and Heister, 1995). Also, results showing effects between non-high quality child care and children's developmental outcomes are limited and unclear. Unpublished studies finding small or non-significant negative effects (Roggman et al., 1994; Blau, 1999), selection bias problems (Early and Burchinal, 2001; Peyton et al., 2001), and the lack of consensus on child care quality definitions (Blau and

generally prefer better quality child care for their children (Peyton *et al.*, 2001), parents' decisions do not always follow developmental theory recommendations. For example, parents can value and prefer a child care provider who shares their cultural background more than a child care provider with a higher educational level on psychology or child development. Also, parents do not always agree with developmental psychology quality definitions, because they consider these definitions and measures inaccurate, they culturally value different child care characteristics or methods, or they are constrained to available and affordable arrangements (Blau and Hagy, 1998; Waldfogel, 2002). As a consequence, parental perspectives, definitions and preferences of what good quality and suitable child care arrangement is, varies. In this context, quantity issues become essential.

Economists define the child care quantity (or supply) problem[6] as the difference between formal child care availability and child care demand. In the United States, the child care market faces the problem of larger formal child care demand compared to the child care formal market supply. Studies indicate that parents address the lack of formal child care arrangements using informal lower-quality child care. In this situation, families face a trade-off between lower monetary costs and more flexibility (*e.g.* parents can use informal kin-based arrangements for free and during non-standard hours), and higher costs associated with diminishing the quality and stability of child care providers (Fuller *et al.*, 2001; Meyers *et al.*, 2002).

In addition to financial aspects, increasing child care quantity is important because it augments the range of child care possibilities. Studies show clear differences in parental child care preferences, particularly among *racial/ethnic groups* (Berguer and Black, 1992; Fuller *et al.*,

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Hagy, 1998; Peyton et al., 2001; Blau and Mocan, 2002; Brooks-Gunn et al., 2002; Waldfogel, 2002) explain the lack of conclusive results on non-high quality child care.

1996; Kisker and Ross, 1997; Singer *et al.,* 1998; Uttal, 1999; Early and Buchinal, 2001; Brewster and Padavic, 2002; Smith, 2002). For example, research shows that White parents generally prefer center-based settings because of their *pro-education* characteristics. Although Black parents also value cognitive enhancing characteristics, they also consider caring and sensitive child care characteristics as very important, particularly in situations when children are sick. Thus, African American parents are more likely to prefer family or kin-based care. Hispanic parents generally prefer parental child care, but qualitative studies present Hispanic mothers (and also African American mothers) considering kin-based child care as an appropriate substitute to maternal child care. Contrarily, White mothers view kin-care as inappropriate, on average (Uttal, 1999; Brewster and Padavic, 2002).

Expanding the number of potential child care alternatives improves parents' likelihood of finding child care arrangements that match their preferences. Finding child care arrangements that are sensitive to parental preferences reduces parents' concerns about potential negative consequences for their children, lowers maternal distress levels, and hence, improves mother's emotional well-being and employment stability. This enhances mother-child interaction quality and thus improves children's developmental outcomes (Mason and Duberstein, 1992; Ribar, 1992; Kisker and Ross, 1997; Fuller *et al.*, 2001; Peyton *et al.*, 2001).

The importance of quantity

The child care quantity problem has two major components, one associated with financial aspects and high costs, and the second one associated with the lack of available alternatives that suit parents' preferences. Because many parents are not willing, or do not have the resources to

6 Child care labor supply represents the most commonly used child care market supply proxy, particularly for trends in the supply (Blau, 2001).

pay for expensive formal child care arrangements, the supply of formal child care settings is smaller than its demand. As a consequence, child care providers are not able to increase the number of formal high-quality child care centers (given the high costs of child care services), which limits the range of formal child care arrangement options. In this circumstance, parents are less likely to find child care arrangements that match their preferences, particularly in terms of quality and racial/ethnic values.

An effective way to increase the number of formal child care settings is transferring subsidies to families with young children. Research indicates that receiving child care subsidies increases maternal labor force participation (Kimmel, 1995 Kimmel, 1998; Oppenheim and Kuhlthau, 1992; Ribar, 1992; Ribar, 1995; Fuller et al., 2001). Maternal work participation expansions have positive impacts on the non-maternal formal child care demand. Larger child care market demand expands child care settings' quantity, and also subjective (*i.e.* parental satisfaction) and objective child care quality measures (Berger and Black, 1992).

Although financial aspects of child care quantity get more attention, particularly within policy makers' circles, evidence shows that non-financial elements of care, such as kin availability, play a very important role in child care selection and early maternal work return (Klerman and Leibowitz, 1990). Smith (2002), using SIPP 1996 data, shows that among those receiving child care government transfers, 28 percent does not use formal-based child care, but kin-based care. Early and Burchinal (2001) show that Black and White pre-school children's parents prefer center-based settings with *pro-education* orientations. Black parents with infants and toddlers are more likely to use family or kin-based places, *where their children could be care for, when they are sick;* and Hispanic parents generally prefer parental child care. These differences emphasize the existing demand for specific types of arrangements, sensitive to

parent's racial/ethnic preferences, even after controlling for financial factors. Indeed, studies indicate that, although both Black and Hispanic mothers prefer kin-based child care, African American mothers receiving child care subsidies increase their use of center-based child care,[7] whereas Hispanic mothers collecting these transfers, do not increase significantly their use (Fuller *et al.*, 1996).

Economic consumer theory assumes that, as the number of options increases, the likelihood of finding options that maximize the utility function[8] of individuals increases as well. In this context, the *quantity* of child care arrangements has significant importance, not only in terms of the number of available arrangements, but also the range of potential options that parents can choose from. Increasing child care supply or *quantity,* enhancing the demand for *quality* child care arrangement use sensitive to racial/ethnic preferences not only moves child care market to a *supply-equal-demand* equilibrium point but also improves parental and children's well being.

The importance of preferences and maternal satisfaction

Child care quality and quantity expansions reduce many child care problems, but improving child care *quantity* and *quality* while considering parental *preferences,* augments the likelihood of finding quality child care settings sensitive to parents' choices. Kisker and Ross (1997) find lower maternal distress levels and fewer negative consequences for children, among

7 Brewster and Padavic (2002) argue that African American mothers are less likely to use kin child care in 1994 compared to 1977. However, this reduction in relative care use could be related to economical changes (i.e. increase in the opportunity cost of caring for children and not entering the labor market), rather than actual changes in preferences.

8 The *utility function* is an abstract mathematical representation of consumer preferences. The function represents the utility level or well being associated with the amount of goods consumed. The level of utility changes as the individual consumes more normal goods (Varian, 1999).

mothers whose child care preferences are met. Several variables, such as family income and child care subsidies availability, children's age, geographic location with respect to other relatives, child care arrangements' quality and costs, parental working schedules and shifts, and welfare requirements, affect these preferences. However, research shows that even after controlling for these variables, child care preferences are largely predicted by *racial/ethnic characteristics* (Berguer and Black, 1992; Fuller *et al.*, 1996; Kisker and Ross, 1997; Singer *et al.,* 1998; Uttal, 1999; Early and Buchinal, 2001; Brewster and Padavic, 2002; Smith, 2002).

Although *cultural factors* (*i.e.* practices associated with cultural-racial/ethnic preferences) and *structural factors* (*i.e.* responses to contextual circumstances such as social or economic conditions) can be confounded, we can still find racial/ethnic differences in formal and informal-based care use. Studies show that African American and Hispanic (particularly Mexican American) families have stronger sense of obligation to kin than Anglo American families (Uttal, 1999; Brewster and Padavic, 2002).[9] However, Uttal (1999) finds that among African American and Hispanic families, kin-based child care functions as a work source for family members whose benefits of staying at home working as child care providers, rather than entering the labor force, is higher. Brewster and Padavic (2002) support this statement finding that Black parents' kin-based child care use is diminishing. Analyzing the 1977-1994 period, these authors observe higher opportunity costs of staying at home providing child care (due to the advantageous economic circumstances), increasing center-based child care arrangement consumption.[10] Nevertheless, although these qualitative studies report *structural* factors affecting parental child

9 Jayakody (1998) finds that White single mothers are more likely to receive financial assistance from relatives, particularly parents, than Black single mothers. These results show that relative and parental income levels determine financial support. However, non-financial factors such as racial/ethnic characteristics are likely to affect non-economic support, such as child care assistance.

10 Additionally, family's geographic proximity and availability affects positively the likelihood of using kin-based care.

care arrangement decisions, *cultural-racial/ethnic* differences remained when considering center-based or kin-based use as an appropriate practice.[11]

Predicting preferences accurately is essential for understanding maternal emotional and stability processes and children's outcomes. Studies indicate that using child care arrangements sensitive to parental preferences reduces parental, and mainly maternal, fears about harmful child care environments (Kisker and Ross, 1997). This anxiety reduction improves maternal labor market productivity and self-confidence, as well as emotional well-being and satisfaction. Both, emotional and labor market stability/satisfaction have positive effects on children's well-being.

Clark *et al.* (1997) notice that maternal satisfaction and stability levels (*i.e.* whether or not new mothers manage to combine mother and worker/non worker roles and feel satisfied) determine the mother-infant bond quality. They also find that mother-child relationship quality mediates non-maternal child care and children's developmental outcomes' association. Allhusen *et al.* (2001) support this idea finding smaller non-maternal child care effects compared to family factors such as maternal sensitivity on children's socio-emotional outcomes. Consequently, increasing maternal satisfaction and well-being enhances mother-child relationship's quality, and hence improves children's developmental outcomes (Mason and Duberstein, 1992; Ribar, 1992; Peyson *et al.*, 2001).[12]

Most economic studies consider only dichotomous maternal vs. non-maternal child care use and preference decisions (Becker, 1965; Becker, 1993; Ribar, 1992; Kimmel, 1995; Ribar,

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11 The study shows Hispanic and African American mothers perceiving kin-based child care as appropriate, and Anglo American mothers viewing this arrangement as inappropriate. However, factors such as feelings of reciprocity and obligation avoidance, and conflicts around parenting styles, reduce the likelihood of considering kin-based arrangements as preferred.

12 However, it is it is important to consider potential selection bias problems. Peyson et al. (2001) observe that less stressed mothers are also more likely to use high-quality child care.

1995; Schultz, 1995; Kimmel, 1998; Blau, 2001). They find that non-maternal child care preferences and usage are positively associated with maternal labor market participation, supporting human capital theory hypotheses (Becker, 1965; Becker, 1993; Schultz, 1995). Human capital theory assumes that maternal labor force participation increases maternal well-being and human capital, and thus, improves children's well being and developmental outcomes, and particularly cognitive outcomes.

However, studies suggest that additional options, other than the dichotomous maternal-non-maternal care/work-not work decisions, describe maternal child care preferences. These factors are not associated with one specific role, but with multiple maternal roles and their effective management (Amato and Booth, 1997; Clark *et al.*, 1997; Moore and Driscoll, 1997). Meeting maternal child care preferences determine not only mothers' effective multiple roles' managing, but also maternal stability and satisfaction levels, and thus children's development. Amato and Booth (1997) find that maternal labor market participation, controlling for several factors, does not increase mother-child relationship's quality. Moore and Driscoll (1997) confirm this idea finding that mothers, who self-select their labor market entrances (and hence choose non-maternal child care), perceive their children's behavior as more positive. Using the same logic, mothers who are able to self-select non-maternal child care arrangements (*e.g.* center-based, family-based, informal kin-based, informal non-kin-based) sensitive to their preferences are more likely to have and perceive their children more positively.

Racial/ethnic characteristics are fundamental when analyzing and predicting child care preferences and maternal stability and satisfaction. As mentioned above, studies present African American and Hispanic mothers generally choosing and using kin and family-based child care

arrangements, and White working mothers, preferring and using center-based settings (Early and Burchinal, 2001). Consequently, Hispanic mothers forced to use center-based care (*e.g.* because kin-based arrangements are not available, or child care subsidies require using this type of arrangement), experience more stress than White mothers, given the formers' greater preference for *places where children can be cared for, when they are sick* (Early and Burchinal, 2001).

Increasing child care arrangements' *quantity* sensitive to maternal *racial/ethnic* specific *preferences*, improves mothers' ability to find *quality* child care arrangements. Reducing maternal anxiety associated with harmful child care arrangements improves maternal labor market productivity and self-confidence, as well as mother-child interaction quality (Mason and Duberstein, 1992; Ribar, 1992; Kisker and Ross, 1997; Peyson *et al.*, 2001; Waldfogel, 2002). Hence, more involved mothers, sensitive to their children needs, enhance positive children's developmental outcomes.

AIMS OF THE STUDY

Non-maternal child care use has direct and indirect effects on children's development. The direct effects have been widely studied, and they include the effect on cognitive, social, and emotional development, and mother-child attachment bond. Also, they analyze the effect of high and non-high quality child care on children's developmental outcomes (Chase-Landale and Owen, 1987; Belsky and Rovine, 1988; Belsky, 1992; Ribar, 1992; Kimmel, 1995; Ribar, 1995; Kimmel, 1998; Blau, 2001). Fewer studies analyze the *indirect effects of non-maternal child care on children's well-being,* through *maternal work stability*. Studies indicate that finding and using child care *arrangements sensitive to parental preferences reduces parents' concerns* about potential negative consequences for their children. Indeed, research shows that parental child

care arrangement preferences are not homogeneous particularly among *different racial/ethnic groups*. Mothers whose child care arrangements match their racial/ethnic preferences, experience lower levels of distress and improve their emotional well-being and employment stability (Clark *et al.*, 1997; Allhusen *et al.*, 2001). This enhances mother-child interaction quality and thus improves children's developmental outcomes (Mason and Duberstein, 1992; Ribar, 1992; Kisker and Ross, 1997; Fuller *et al.*, 2001; Peyson *et al.*, 2001).

The specific questions of this study are:

Question 1

Analyze the effect of parental racial/ethnic characteristics on non-parental center-based, and unpaid and paid family-based child care use patterns. Studies indicate different racial/ethnic child care usage and preference patterns (Tienda and Glass, 1985; Kimmel, 1995; Uttal, 1999, Singer *et al.*, 1998; Early and Burchinal, 2001). Research shows that African American and Hispanic working mothers are more likely to use family and kin-based child care arrangements than Anglo American working mothers (Uttal, 1999; Early and Burchinal, 2001). Also, Brewster and Padavic (2002) find that Hispanic and African American mothers perceive kin-based child care as an appropriate substitute to maternal child care, while Anglo American mothers view this arrangement as inappropriate.

I expect Anglo American parents more likely to use center-based care, and African American and Hispanic parents more likely to use family-based care. In addition to racial/ethnic characteristics, financial factors, such as family income level and subsidy access will affect this likelihood. Parents from higher-income families have more flexibility to choose and use arrangements that match their preferences. Also, maternal access to child care subsidies, increases the likelihood of center-based child care arrangement use. In this situation, parents

whose preferences do not favor formal center-based care use (*i.e*. African Americans and Hispanics) experience higher levels of distress (Early and Burchinal, 2001).

Question 2

Examine the effect of non-parental child care selection (i.e. center-based, unpaid family-based and paid family-based) on maternal work stability by race/ethnicity. Although formal center-based providers are more stable and have higher quality levels on average, African American and Hispanic parents are expected to experience higher levels of stress and lower satisfaction and stability levels associated with center-based child care use. White parents are expected to experience lower levels of stress and higher levels of satisfaction and stability, when using center-based care. Research indicates that non-maternal child care not only has a direct effect on children's developmental outcomes, but also indirect through maternal levels of work stability (Clarke-Stewart, 1992; Allhusen *et al.*, 2001; Pesnew-Feinberg et al., 2001).

I state that center-based has a negative effect on Black and Hispanic mothers' work stability, whereas it has a positive effect on White mothers'. Family-based care use affects positively African American and Hispanic mothers and negatively White mothers. Also, *potential problems of endogeneity* will be solved using an *instrumental variable* for the child care arrangement selection predicted variable.

THE DATA

This study uses data from the 1996 Survey of Income and Program Participation (SIPP). The 1996 survey was administered every four months over 13 waves. The survey is a medium-term longitudinal nationally representative survey, collected every four months over a fifty-two

month period.[13] The four-month collection interval provides more information (compared to surveys collected once a year) particularly important to analyze the dynamics of child care usage, maternal work status and emotional well-being and stability.[14] The SIPP includes a core survey gathered every four months and topical modules that vary from one wave to the other. This study uses the *child care*[15] *and work schedule* module and the *children well-being* module, collected at waves 4 and 10 and waves 6 and 12 respectively.

Waves are divided into four rotation sub-sample groups. Each rotation group is interviewed during one of the four-month wave cycle months, collecting current and historical (prior four months) information. Although the SIPP sample has a stratified household random sample selection, it is a person-based rather than a household-based survey. The initial sample members are all individuals in the household (members and non-members of the household), and they are interviewed in following waves regardless of their household member or non-member status.

This study's final sample includes waves 4 through 6 and 10 through 12. These waves were selected in order to examine the impact of child care use (waves 4 and 10) and preferences on mother's employment (follow up waves 5, 6, 11 and 12). Also, the sample incorporates information from earlier waves in order to obtain information about prior conditions such as maternal work and welfare status, and family living condition changes. The remaining waves are

13 The 1996 panel has 13 waves starting on April 1996 and ending on March 2000. See http://www.sipp.census.gov/sipp/organizing.html for more detailed information about the sample and collection dates.

14 See Appendix 1 for comparisons with other surveys and more detailed presentation of the advantages and disadvantages.

15 The child care topical module collects information from the four youngest children 15 years old and younger in the household.

excluded from the final sample either because they do not contain child care information or we cannot use them to analyze child care effects on maternal work dynamics.

The child care information is not collected at every wave, limiting the number of waves available for this study.[16] However, the child care module includes information about all child care arrangements, an improvement compared to prior years in which they only gathered information about one or two arrangements. A second limitation is attrition, a common problem among longitudinal studies. As a consequence, some individuals do not have reported information in some waves. In order to solve this problem, we impute some values. First, we impute missing mothers' information with female guardians' information.[17] Second, we use previous wave's information to impute the remaining missing information. Imputing observation allows us to retain observations that otherwise would have been eliminated. However, the final sample excludes individuals with missing observations in all but one wave.

Additionally, the final sample includes only children three years and younger. This subgroup of children is selected for several reasons. First, the number of non-maternal child care arrangements available for infants and toddlers is smaller compared to those for preschool-aged children (particularly formal arrangements). Consequently, there are fewer studies focusing on this age group, and they mainly center their attention on parental care. Second, studies show different parental child care preferences for infants and toddlers compared to preschool-aged children (Early and Burchinal, 2001; Fuller *et al.*, 2001; Smith, 2002). Third, infants and toddlers are in different developmental stages compared to three to five year old children. As a

16 Although there are limitations with the child care information, we consider working with the SIPP more advantageous than using other surveys, because it contains information on mothers' work dynamics using shorter intervals (i.e. four months rather than one year).

17 Also missing fathers' information is imputed using male guardians' information.

result, the type of stimulation developmentally valued in child care settings for infants and toddlers (*e.g.* emotional, attachment-bond related stimulation) is different from the one valued for preschool-aged children (*e.g.* school readiness, cognitive and social stimulation).

Table 1
Sample Description: All Waves

	Weighted		Unweighted	
	Population Size	**Percentage**	**Number of observations**	**Standard Deviation**
Total Population	64,763,679		18,867	
Race/ethnicity				
White Non-Hispanic	42,567,308	65.7%	12,339	0.48
Black Non-Hispanic	11,192,412	17.3%	3,274	0.38
Hispanic	8,473,500	13.1%	2,465	0.34
Other	2,530,459	3.9%	789	0.20
Age				
Under 1 years old	10,433,816	16.1%	3,124	0.37
1 year old	17,046,536	26.3%	4,975	0.44
2 years old	18,928,670	29.2%	5,493	0.45
3 years old	18,354,658	28.3%	5,275	0.45
Main child care arrangement at wave 4				
Center-based	3,739,225	22.3%	1,220	0.41
Unpaid Family-based	5,082,786	30.3%	1,770	0.47
Paid Family-based	4,460,336	26.6%	1,449	0.44
Parental	3,512,080	20.9%	1,138	0.40
Waves				
Wave 4	16,794,428	25.9%	5,577	
Wave 5	7,936,302	12.3%	2,463	
Wave 6	7,037,672	10.9%	2,084	
Wave 10	18,414,645	28.4%	5,044	
Wave 11	7,736,318	11.9%	1,977	
Wave 12	6,844,314	10.6%	1,722	

Source: 1996 SIPP

Table 1 describes this study's sample. The total (unweighted) sample size is 18,867 children 3 years and younger, which represents a total (weighted) population size of 64,763,679. This study uses weighted data in order to correct for oversampling during the collection and design of the survey. Using the unweighted sample will lead to overrepresentation of

populations who were deliberately oversampled during the survey's designed, in order to get representative samples of these groups.[18]

These data include children from waves 4 to 6 and from waves 10 to 12. The population's distribution by race/ethnicity shows that 66% of the population is non-Hispanic White, 17%, non-Hispanic Black, 13% Hispanic and 4% *others,* which includes Asian or Pacific Islanders, American Indians, Aleut and Eskimo children. This study's final sample excludes children who fall in the *other* racial/ethnic category, reducing the sample, size to 18,078 children. Because the *other* category clusters different racial/ethnic groups with dissimilar characteristics and preferences, clear inferences with respect to non-parental child care and work preferences and stability are hard to draw. This population's age distribution indicates that children under 1 year of age represent 16%, 1 year old children 26%, 2 years old children 29% and 3 years old 28%.

Table 1 also shows the distribution by main child care arrangement at wave 4. The main arrangement is established using the maximum total number of hours the child spends on a specific regular arrangement during a typical week.[19] The center-based arrangement category groups children using Head Start, child care/daycare centers or Nursery/preschool arrangements. Children whose main arrangement is center-based represent 22% of our population at wave 4.

Family-based arrangements include children who are care for by siblings, grandparents, other relatives, family daycare providers and non-relatives. We subdivide this category in paid family (*i.e.* those who receive monetary payments) and unpaid family arrangements (*i.e.* those who do not receive monetary payments). Children using unpaid family providers represent 30%

18 See http://www.sipp.census.gov/sipp/weights.html for more information on SIPP weights.

19 Regular arrangements are defined as arrangements used at least once a week during the past month.

and those using paid family, 27% at wave 4. The parental care category includes children cared by the survey's main respondent parent or the other parent or stepparent. The proportion of children using parental care as their main arrangements at wave 4 is 21%. Finally, Table 1 reports the distribution by wave. Waves 4 and 10 contain larger proportions of the total sample (26% and 28%). Waves 5, 6, 11 and 12 exclude children who do not have information on waves 4 or 10.

RESULTS

Descriptive Findings

Table 2 describes the distribution of children by main child care arrangement and race/ethnicity at wave 4.[20] The unweighted sample is 5,331 children and the weighted sample is 16,075,089 children. The main arrangement most commonly used by children three years and under is unpaid family (30%) followed closely by paid family care (27%). Parental care is the main arrangement used most infrequently (21%). Regardless of their race/ethnicity, family based arrangements are the most common source of care, although the specific type of family care varies by racial/ethnic groups. African Americans and Hispanics use unpaid family care most frequently (39% and 35% respectively), and Whites rely mainly on paid family-based arrangements (27%). Whereas center-based care is Hispanics and Whites' least frequently used arrangement (12% and 23%), parental care is Blacks' most uncommonly used arrangement (11%).

These results indicate that some differences by race/ethnicity exist. Increasing numbers of mothers entering the labor force, reduce the proportion of time mothers (and fathers) spend

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20 See Appendix 2 for information at wave 10.

with their children, contributing to greater non-parental child care use. However, Hispanics' parental care usage is almost twice as Blacks', and their percentage using center-based care is almost half as Blacks' and Whites'. These results are potentially indicating two things. First, stronger feelings against center-based child care among Hispanics. Second, Hispanics face additional restrictions for using this type of arrangement, for instance, they are not eligible for child care subsidies, there are fewer bilingual centers, or there are fewer centers available closer to Hispanic neighborhoods.

Table 2
Main child care arrangement used: Waves 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Weighted				
Total	100.0% (16,075,089)	68.8% (11,054,833)	18.3% (2,946,595)	12.9% (2,073,661)
Center-based	22.5% (3,614,661)	23.2% (2,562,843)	27.1% (798,221)	12.2% (253,598)
Unpaid Family-based	29.8% (4,796,740)	26.3% (2,906,893)	39.4% (1,160,273)	35.2% (729,574)
Paid Family-based	26.7% (4,294,984)	26.7% (2,947,463)	22.1% (651,011)	33.6% (696,510)
Parental	21.0% (3,368,704)	23.9% (2,637,634)	11.4% (337,090)	19.0% (393,979)
Unweighted				
Total	5,331	3,592	1,043	696
Center-based	1,178	818	276	84
Unpaid Family-based	1,669	985	431	253
Paid Family-based	1,395	942	221	232
Parental	1,089	847	115	127

Source: 1996 SIPP
Note: The numbers in parentheses are the weighted population sizes

Family-based arrangements are likely to substitute parental care, however they display some differences by race/ethnicity. As mentioned above, Blacks and Hispanics are more likely

to use unpaid family, whereas Whites are more likely to rely on paid family. These results support the idea that Blacks and Hispanics have stronger feelings of obligation towards their relatives. Also, it is possible that because Hispanics and Blacks tend to live geographically closer to their relatives than Whites, family child care arrangements are more available as well.

Table 3
Child care arrangement used: Waves 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Center-based	**25.9%**	**27.1%**	**28.7%**	**15.5%**
Head Start	0.9%	0.4%	2.7%	1.0%
Child care or daycare center	18.9%	20.0%	20.6%	11.1%
Nursery or preschool	6.6%	7.3%	6.1%	3.8%
Unpaid Family-based	**42.3%**	**40.6%**	**48.6%**	**42.8%**
Sibling 15 or older	3.3%	2.8%	4.3%	4.9%
Sibling 14 or younger	1.8%	2.0%	0.9%	2.3%
Grandparent	29.1%	29.2%	31.8%	25.0%
Other relative	10.4%	9.2%	13.2%	12.7%
Family daycare provider	0.9%	0.8%	1.0%	1.6%
Non-relative arrangement	4.8%	4.8%	5.9%	3.1%
Paid Family-based	**30.8%**	**31.7%**	**23.8%**	**36.1%**
Grandparent	5.1%	4.3%	4.0%	10.9%
Other relative	4.3%	3.3%	6.9%	5.7%
Family daycare provider	10.6%	13.2%	6.3%	3.3%
Non-relative arrangement	12.2%	12.5%	7.5%	17.1%
Parental	**30.4%**	**35.4%**	**16.0%**	**24.5%**
Other parent	27.5%	31.8%	15.0%	22.6%
Main respondent parent	4.6%	5.7%	1.5%	2.9%

Source: 1996 SIPP
Note: Bold numbers are the combine groups' percentage of children by race/ethnicity

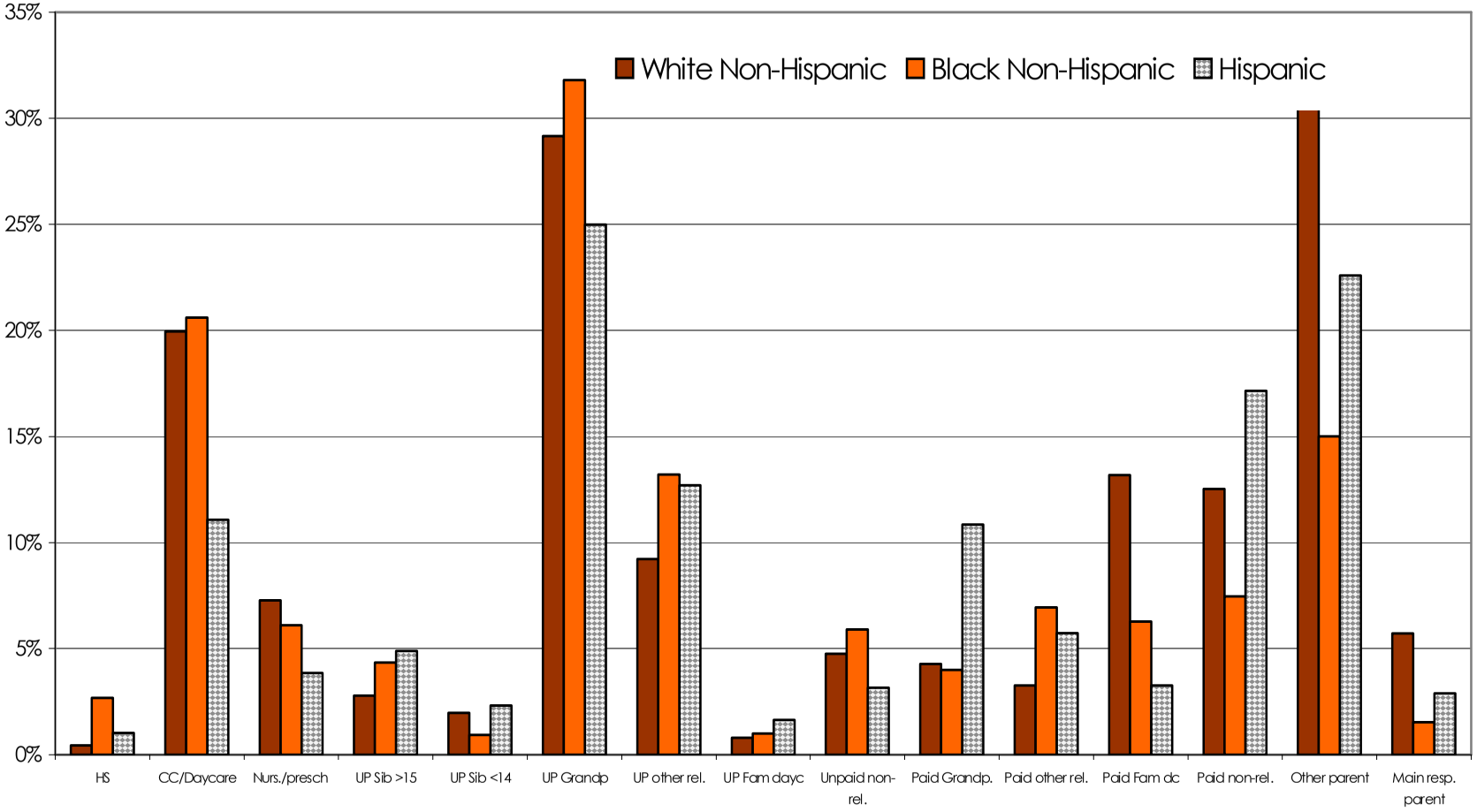
Table 3 and Figure 1 present a more detailed description containing the proportion of people using center-based (*i.e.* Head Start, child care or daycare centers and nursery or preschool), unpaid and paid family-based (*i.e.* siblings, grandparents, other relatives, family day care providers and non-relatives) and parental (*i.e.* custodian and other parent) grouped and specific child care arrangements. The numbers in Table 3 differ from those in Table 2 because

they also include people who use these arrangements, even when they are not their main arrangement. The percentages are children using those arrangements proportionate to the total population and by race/ethnicity. Although bold numbers are the grouped arrangement' percentages, the disaggregated arrangements' numbers will not add to the bold numbers because children are likely to use more than one of those specific arrangements.

Overall, child care/daycare centers represent the largest arrangement used within the center-based arrangement group (19%). Head Start represents the smallest proportion (0.9%), particularly because the availability of Head Start settings for children 3 years and younger (*i.e.* Early Head Start) is modest. Consequently, although we are aware of potentially large disparities between Head Start and other center-based arrangements, income and child care quality biases are not very likely to affect the current results, given the non-significant proportion of Head Start participants. Among this small proportion, African American children are more likely to use Head Start (3%). Also, a larger proportion of Blacks utilize child care or daycare arrangements (21%), and Whites are more likely to use nursery or preschool arrangements (7%) compared to any other racial/ethnic group.

Among those using unpaid family based arrangements, grandparents are most likely to provide care (29%) and family daycare providers is the least common arrangement (1%) across all racial/ethnic groups but Blacks, whose least frequent arrangement is siblings 14 years or younger (1%). Compared to African Americans and Whites, Hispanics are more likely to use unpaid family daycare providers (2%) and siblings (15 years or older 5% and 14 or younger 2%). Blacks are more likely to use unpaid grandparents (32%), other relatives (13%) and non-relatives (6%).

Figure 1
Child care arrangement use: by race/ethnicity



Source: 1996 SIPP

The paid family base arrangement distribution shows a different pattern. Non-relative arrangements are the most likely across all racial/ethnic groups (12%). Whites are least likely to use paid other relatives (3%), paid grandparents are least frequent among Blacks (4%), and family daycare providers, among Hispanics (3%) compared to other arrangements and other racial/ethnic groups. African Americans are least likely to rely on non-relative arrangements (8%), compared to Whites and Hispanics. With respect to parental care, main respondent parents are least likely to provide care (5%), while other parents are most likely to do it (28%). White parents are most likely to provide both types of parental care (6% and 32%).

Table 4
Proportion of children who changed main arrangement type
From wave 4 to wave 10

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Center-based	41.7%	43.3%	29.1%	71.9%
Unpaid Family-based	57.3%	61.7%	52.0%	47.0%
Paid Family-based	54.4%	50.8%	70.2%	55.8%
Parental	59.6%	62.2%	52.1%	50.0%
Total	53.9%	54.9%	50.6%	53.3%

Source: 1996 SIPP Waves 4 and 10 topical modules
Note: Main child care arrangement classifications are based on wave 4 main arrangements.

Table 4 shows the proportion of children who changed main child care arrangements from wave 4 to wave 10. Overall, there is a great degree of main child care arrangement use instability, predominantly among those using parental care (60%) and least among those relying on center-based care (42%). Although Whites show a pattern similar to the overall distribution, Blacks and Hispanics evidence different distributions. Among African Americans, paid family arrangements are the most unstable (70%) and center-based the most stable arrangements (29%). Hispanic children, on the other hand, are most likely to change main child care arrangements if

they use center-based care at wave 4 (72%) and least unstable when relying on unpaid family care (47%). On the whole, larger proportions of White children move to different main arrangements (55%), compared to Blacks (51%) and Hispanics (54%).

In addition, Table 4 shows that among those whose main care source is center-based, Hispanic children are more likely to change arrangements (72%) compared to Whites and Blacks. Whites using unpaid family (62%) and Blacks using paid family care (70%) are more likely to change main arrangements, compared to the other two groups. Additionally, White children, whose main source of care is their parents at wave 4, are more likely to use a different type of arrangement at wave 10 (62%), compared to Blacks and Hispanics.

Table 5 presents a more detailed child care dynamics' description, including specific initial and final child care arrangements. This table presents two percentages per cell. The one on top represents the row percentage with respect to the total, describing how children, who start in a specific child care arrangement at wave 4, are relocated or stayed in the same arrangement at wave 10. The second row (*i.e.* the one in parentheses) represents the column percentage denoting how children, who are moving to a specific arrangement at wave 10, were distributed at wave 4. The percentages in the diagonal represent the proportion of children who remained in the same arrangement[21] and those in the off-diagonal the proportion of children changing arrangements.[22]

21 However, it is possible that additional changes had occurred between waves.

22 The row sums of the numbers in the off-diagonal are equal to the numbers reported in Table 4.

Table 5
Child care dynamics: Main arrangement

Wave 4	Wave 10 Center-based	Unpaid Family-based	Paid Family-based	Parental
Total Population				
Center-based	58.3% (39.6%)	10.2% (8.2%)	19.2% (14.4%)	12.3% (13.1%)
Unpaid Family-based	22.5% (20.6%)	42.7% (46.0%)	21.1% (21.4%)	13.8% (19.8%)
Paid Family-based	23.7% (23.3%)	20.5% (23.7%)	45.6% (49.6%)	10.1% (15.6%)
Parental	20.3% (16.5%)	23.1% (22.1%)	16.2% (14.6%)	40.4% (51.5%)
White non-Hispanic				
Center-based	56.7% (39.9%)	9.8% (9.2%)	20.8% (14.8%)	12.6% (13.1%)
Unpaid Family-based	20.7% (16.8%)	38.3% (41.6%)	23.2% (18.9%)	17.8% (21.3%)
Paid Family-based	22.0% (21.9%)	18.4% (24.6%)	49.2% (49.5%)	10.4% (15.3%)
Parental	23.6% (21.4%)	20.3% (24.6%)	18.4% (16.8%)	37.8% (50.4%)
Black non-Hispanic				
Center-based	70.9% (43.3%)	13.2% (10.2%)	7.8% (13.3%)	8.1% (17.0%)
Unpaid Family-based	30.0% (28.5%)	48.0% (57.8%)	14.1% (37.3%)	7.9% (25.9%)
Paid Family-based	41.6% (24.0%)	24.8% (18.1%)	29.8% (47.9%)	3.8% (7.5%)
Parental	14.0% (4.2%)	36.3% (13.8%)	1.9% (1.6%)	47.9% (49.5%)
Hispanic				
Center-based	28.1% (19.2%)	4.3% (1.2%)	42.7% (13.2%)	24.9% (10.3%)
Unpaid Family-based	15.7% (32.0%)	53.0% (45.4%)	25.1% (23.1%)	6.2% (7.7%)
Paid Family-based	14.6% (37.5%)	26.2% (28.6%)	44.2% (51.8%)	15.0% (23.5%)
Parental	5.9% (11.3%)	30.6% (24.8%)	13.5% (11.8%)	50.0% (58.4%)

Source: 1996 SIPP Waves 4 and 10 topical modules
Note: The sample size is smaller because we only included children who were interviewed in waves 4 and 10

Also, Table 5 shows that, overall, children using center-based care at wave 4 are more likely to move to paid family-based care (19%). Contrarily, those using family based providers

(*i.e.* unpaid and paid) are more likely to move to center-based arrangements (23% and 24%). Children using parental care are more likely to move to unpaid-family care (23%). Although child care arrangements are highly variable over time, across all racial/ethnic groups, we still find some differences by groups.

Among Whites, children change with higher probability to paid family arrangements (those using center-based 21% and unpaid family care 23%) and center-based arrangements (those using paid family 22% and parental care 24%). African American children are also more likely to switch to center-based (from unpaid 30% and paid family 42%) and unpaid family arrangements (from center-based 13% and parental 36%). Hispanics move to family based arrangements with higher probability, from center-based and unpaid family to paid family (43% and 25%) and from paid family and parental to unpaid family (26% and 31%).

These results suggest that White parents are more likely to move their children to (and potentially prefer) center-based arrangements, considering this arrangement as a better substitute for parental care. Additionally, we observe that this group is more likely to move to paid family arrangements. On the contrary, although African American children move to center-base arrangements with higher probability, this change is potentially due to increases in external monetary help (*i.e.* governmental or private child care subsidies) rather than actual preferences. Also, these children are more likely to use unpaid family care, suggesting that these children's relatives are more willing, or feel a stronger responsibility to provide child care. Changes in Hispanic children's arrangements move towards family-based care, supporting the previous statement of larger Hispanic preferences for family-based arrangements as parental care substitutes.

In addition, Table 5 shows that family-based arrangements are most unstable across all racial/ethnic groups. Among Whites, children moving to center-based and unpaid family care are most likely to use paid family at wave 4 (22% and 25%). Also, children changing to paid family and parental arrangements used unpaid family care (19% and 21%). African American children who moved to center-based, paid family and parental care most likely used unpaid family (29%, 37% and 26%), and paid family if they moved to unpaid family care (18%) at wave 10. Hispanics, on the other side, were most likely to rely on paid family at wave 4, among those moving to center-based (38%), unpaid family (29%) and parental arrangements (24%). Hispanic children using unpaid family at wave 10 mostly used paid family at wave 4 (23%).

Table 6
Number of non-parental arrangements: wave 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
0 arrangements	12.2%	13.3%	7.7%	13.2%
1 arrangement	77.4%	75.2%	83.8%	79.9%
2 arrangements	9.4%	10.4%	8.0%	6.2%
3 arrangements	0.9%	1.1%	0.4%	0.7%
Total	(16,075,089)	(11,054,833)	(2,946,595)	(2,073,661)

Source: 1996 SIPP Waves 4 topical module

Moreover, Table 6 describes the number of non-parental arrangements experienced at wave 4.[23] Overall, 77% of children experience only one type of non-parental arrangement, observing a similar pattern across all racial/ethnic groups. White children are more likely to have zero non-parental arrangements (13%) compared to Blacks and Hispanics, and Blacks are more likely to have one arrangement (84%). Whites are more likely to experience two (10%) and three (1%) arrangements other than parental care compared to the remaining groups.

23 Wave 10's distribution is very similar to the one found at wave 4.

Consequently, these results suggest that even though children are likely to experience unstable arrangements over time, they are less likely to have multiple arrangements at a specific point in time.

Table 7
Other child care characteristics: Children cared at home at Wave 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Cared at child's home	48.6%	50.3%	38.4%	54.5%
Other parent	25.0%	28.8%	13.3%	21.3%
Main respondent parent	3.2%	4.0%	0.9%	1.8%
Sibling 15 or older	3.2%	2.7%	3.6%	4.8%
Sibling 14 or younger	1.8%	1.9%	0.9%	2.3%
Grandparent	14.1%	13.0%	14.6%	18.8%
Other Relative	7.0%	6.3%	7.9%	9.5%
Non-relative	7.1%	7.5%	5.6%	7.2%

Source: 1996 SIPP

Furthermore, Table 7 presents additional child care characteristics, showing variations between racial/ethnic groups. We observe that a larger proportion of Hispanic children are cared at their homes (55%). Disaggregating these results by child care provider, we observe that other parents (*i.e.* non-main respondent) care their children at their homes most frequently (25%), particularly among Whites (29%), and least frequently among Blacks (13%). The lower chance of co-residence with their children among Blacks explains these results.[24]

Considering the non-parental arrangements group, grandparents are the most likely to provide care at the child's home (14%). Hispanic grandparents are most likely to do it (19%), compared to African Americans and Anglo Americans, potentially given their higher likelihood of co-residing with their grandchildren. A similar implication could be applied to other relative category's results (greatest among Hispanics, 10%).

24 This is, 36% among Blacks compared to 84% among Whites and 74% among Hispanics (SIPP 1996)

Children cared by their parents at their homes represent the largest proportion, nevertheless the number of hours per week children spend with their parents (see Table 8) is the lowest (6 hours), particularly among African American children (4 hours). Compared to the other two groups, Blacks utilize center-based arrangements (10 hours) more than double the time as parental arrangements. Contrarily, Hispanic children spend more time on parental care (6 hours) than on center-based arrangements (4 hours). This result supports our previous statement of larger parental care preferences among Hispanics.[25] Also, all children but African Americans, spend longer hours in paid family arrangements (Whites 10 hours and Hispanics 12 hours). Black children spend more time with unpaid family (13 hours).

Table 8
Other child care characteristics: Child care dynamics at Wave 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Number of hours (per week)				
Center-based	7.86	7.93	10.00	4.44
Unpaid Family-based	9.59	8.42	13.19	10.69
Paid Family-based	10.00	10.00	8.46	12.19
Parental	6.23	6.91	3.61	6.36
Changed regular arrangements (past 4 weeks)	7.3%	8.7%	4.4%	3.7%
Center-based	5.8%	5.8%	6.6%	2.9%
Unpaid Family-based	5.0%	5.4%	4.5%	4.0%
Paid Family-based	11.7%	15.2%	3.4%	4.8%
Parental	6.5%	8.0%	1.0%	1.4%

Source: 1996 SIPP

Also, larger proportions of children using paid family care experience unstable arrangements (in the previous 4 months) (12%). Whites are more likely to have unstable

25 Nevertheless, it is also possible that Hispanic children use center-based care less, because of non-eligibility issues (i.e. non-citizenship, parents are more likely to be married, have fewer center-based settings available).

arrangements within the previous 4 months (9%) particularly those using paid family care (15%). This percentage represents five and three times the proportions of Blacks and Hispanics (3% and 5%). Although Blacks and Hispanics are more likely to have unstable jobs and lower income, they are more likely to maintain regular child care arrangements, at least within a shorter period of time.

Table 9
Other child care characteristics: Child care costs at Wave 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Child care costs (per week)	33.6	37.3	24.3	27.2
Government helped pay for child care	4.1%	2.6%	10.8%	2.5%
Center-based	9.5%	3.8%	26.8%	13.3%
Unpaid Family-based	2.6%	2.1%	4.7%	1.2%
Paid Family-based	2.5%	2.0%	5.6%	1.5%
Parental	2.4%	2.5%	4.3%	0.0%
Non-governmental aid helped pay for child care	7.4%	6.0%	14.0%	5.8%
Center-based	15.3%	9.7%	33.0%	16.3%
Unpaid Family-based	4.4%	4.5%	5.2%	2.5%
Paid Family-based	6.7%	5.8%	9.9%	7.7%
Parental	4.3%	4.3%	7.0%	2.0%

Source: 1996 SIPP

Furthermore, Table 9 evidences that African American child care payments per week are the lowest (24 dollars), even though they spend on average longer hours on center-based arrangements. Larger proportions of African American people receiving governmental (11%) and non-governmental (14%) monetary help, explain this seeming contradiction. Particularly among those using center-based care, we observe that the proportion of Black people who receive governmental help for child care payments (27%) is the highest. This proportion more than doubles the percentage of Hispanics (13%) and it is more than six times Whites' percentage

(4%). Similar proportions are observed for non-governmental help. These results suggest that those helping parents pay for child care arrangements are more likely to support them when they are more willing to use center-based arrangements. This outcome indicates potential inequalities against racial/ethnic groups whose preferences lean more toward parental rather than center-based child care, such as Hispanics.

Demographic characteristics

This section presents demographic, job dynamics and income and poverty characteristics of the sample. Table 10 describes children's demographic characteristics at wave 4.[26] Children relying on center-based main arrangements are, on average, older than children using other arrangements. Among those using center-based care African American children are the oldest (1.95 years old) and Hispanic children the youngest (1.89 years old). Children using parental care are, on the other hand, the youngest across all racial/ethnic groups but Blacks. Although marginally, African American youngest average age correspond to those using paid family care (1.38 years old). These results suggest that parents are more likely to stay with their children when they are younger. Also, these numbers support the statement of greater (non-parental child care) preferences for family-based arrangements compared to center-based care, when children are younger.

In addition, although at the aggregate level, larger percentages of children with excellent and very good health rely on paid family care, we observe some racial/ethnic differences. Black and Hispanic children using paid family care are more likely to be healthier (73% and 80%) than those using other arrangement. Among Whites, those using center-based care are the healthiest

26 See Appendix 3 for information at wave 10.

(83%). The greater percentage of African American children using Head Start programs explains the smaller percentage of healthier children using center-based care (65%). Also, larger proportions of healthier children using paid family care, suggest that parents who are more able to pay for child care, and potentially enjoy higher incomes, have healthier children, among Hispanics and Blacks.

Table 10
Children's characteristics: Demographic characteristics at wave 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Age				
Center-based	1.92	1.91	1.95	1.89
Unpaid Family-based	1.49	1.49	1.49	1.51
Paid Family-based	1.46	1.46	1.38	1.55
Parental	1.36	1.35	1.45	1.33
Sex				
Center-based	50.4%	51.1%	49.9%	45.3%
Unpaid Family-based	48.5%	48.4%	47.1%	51.0%
Paid Family-based	52.4%	51.2%	54.6%	55.1%
Parental	51.9%	53.0%	48.5%	47.4%
Health status (mother's report) (excellent and very good vs. other)				
Center-based	78.0%	83.1%	64.5%	69.1%
Unpaid Family-based	73.5%	77.2%	67.4%	68.5%
Paid Family-based	80.4%	82.2%	72.9%	79.7%
Parental	78.0%	79.7%	65.9%	76.9%

Source: SIPP 1996

Table 11 presents mothers' demographic characteristics at wave 4. These results show that mothers, whose children's main arrangement is center-based, are on average older across all racial/ethnic groups. Younger mothers use unpaid family care, among Blacks (27 years old) and Hispanics (28 years old). White mothers using parental care are, on average, the youngest (29 years old). This result is consistent with the idea that younger mothers are more likely to have lower incomes and hence, less likely to pay for child care.

Table 11
Mothers' characteristics: Demographic characteristics at wave 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Age				
Center-based	30.56	31.16	29.03	29.30
Unpaid Family-based	28.74	29.63	27.07	27.88
Paid Family-based	29.99	30.66	28.62	28.46
Parental	29.13	29.39	28.33	28.09
Less than high school				
Center-based	6.1%	3.8%	10.1%	16.4%
Unpaid Family-based	19.0%	10.2%	25.3%	43.8%
Paid Family-based	9.0%	4.3%	8.9%	28.6%
Parental	12.5%	8.5%	16.1%	35.8%
High school graduate - some college				
Center-based	52.2%	48.0%	63.4%	59.3%
Unpaid Family-based	57.8%	59.0%	66.5%	38.8%
Paid Family-based	51.8%	47.0%	68.0%	56.9%
Parental	53.8%	54.1%	59.3%	46.8%
College graduate				
Center-based	41.7%	48.2%	26.5%	24.3%
Unpaid Family-based	23.3%	30.8%	8.3%	17.3%
Paid Family-based	39.3%	48.7%	23.0%	14.5%
Parental	33.8%	37.4%	24.5%	17.4%
Self-reported health status (excellent and very good vs. other)				
Center-based	64.8%	69.3%	52.4%	58.0%
Unpaid Family-based	58.8%	62.7%	48.2%	60.3%
Paid Family-based	67.2%	69.6%	55.8%	67.7%
Parental	62.6%	65.0%	49.8%	57.4%
Number of children				
Center-based	2.36	2.34	2.51	2.01
Unpaid Family-based	2.47	2.41	2.55	2.58
Paid Family-based	2.40	2.40	2.65	2.20
Parental	2.43	2.44	2.58	2.27
Married				
Center-based	73.9%	85.4%	38.4%	68.7%
Unpaid Family-based	59.5%	73.4%	22.6%	62.6%
Paid Family-based	77.4%	85.7%	44.4%	72.9%
Parental	85.0%	88.4%	58.0%	85.0%
Divorced or separated				
Center-based	9.4%	7.5%	15.2%	9.8%
Unpaid Family-based	10.0%	8.8%	13.4%	9.6%
Paid Family-based	7.7%	7.2%	7.2%	10.1%
Parental	3.7%	3.4%	10.2%	0.0%
Never married				
Center-based	16.5%	6.9%	45.8%	21.5%
Unpaid Family-based	29.5%	16.5%	63.7%	27.1%
Paid Family-based	14.8%	7.0%	47.4%	17.0%
Parental	11.1%	7.9%	31.8%	15.0%

Source: SIPP 1996

Mothers' distribution by educational level supports this previous statement. Overall, Hispanic children are more likely to have mothers with less than high school education.[27] The analysis by arrangement shows that children using unpaid family care are more likely to have mothers with less than high school education, across all racial/ethnic groups. However, Hispanic mothers are more than four times more likely to have less than high school education as Whites (44% and 10%), and almost twice as likely as Blacks (25%). Also, although the smallest proportions of White and Hispanic mothers with less than high school education are among those using center-based arrangements, Hispanics' percentage (16%) is four times larger than Whites' (4%). Black children using paid family care present the smallest percentage of mothers with lower levels of education (9%), even though it is less than a third of Hispanics' proportion (29%).

The proportions of high school graduate/some college and college graduate mothers show variations across racial/ethnic groups and child care arrangements. Overall, Black children are the most likely to have mothers with high school/some college education, and White children most likely to have mothers with college graduate education. Nevertheless, White children using unpaid family have the highest proportion of mothers with high school/some college education (59%), whereas those using paid family care have the largest percentage of mothers using college graduate education (49%). Also, we find differences between Black children's mothers with high school/some college and college graduate education. The former group's largest proportion is among those using paid family care (68%), and the later group's is among those relying on parental care (25%). Hispanic children relying on center-based care are the most

27 Potentially, larger proportions of first generation migrants with no participation in the US educational system increase this percentage.

likely to have mothers with high school/some college as well as college graduate education (59% and 24%).

With respect to mothers' health status, White children are always more likely and Black children are less likely to have healthier mothers. Also, children using paid family-based care have the largest proportions of mothers with excellent and very good health, compared to other arrangements. Table 11 also presents the average number of children per mother. Black mothers show greater numbers of children (under 6 years of age) across all arrangements but unpaid family, where Hispanic have the largest (although marginally) number of children. There are also differences by race/ethnicity. White children using parental care present the largest average number of children per mother (2.4 children), whereas among Blacks and Hispanics, it is those relying on paid (2.7 children) and unpaid (2.6 children) family care respectively.

Moreover, we observe large differences by marital status. White mothers are most likely to be married and least likely to be divorced/separated and never married. On the contrary, Black mothers are least likely to be married and most likely to be divorced/separated and never married. Among Hispanics, mothers whose children use paid family care are the most likely to be divorced/separated (10%) and those using parental are the least likely (0%). The largest proportion of married mothers is located among those using parental care across all racial/ethnic groups. The largest proportion of divorced/separated mothers use unpaid family care among Whites (9%), center-based care among Blacks (15%) and paid family care among Hispanics (10%). Unpaid family-based care is the main arrangement that has the largest percentage of never married mothers across all racial/ethnic groups.

Although married and never married mothers show similar child care use patterns across all racial/ethnic groups, we find differences among divorced/separated mothers. White

divorced/separated mothers are more likely to use unpaid family, suggesting that this group has larger probability of finding relatives with higher income that do not need to be paid or relatives who accept being not paid. Hispanic divorced/separated mothers, on the contrary, are less likely to find relatives with higher income. Although they still use family-based arrangements, their relatives' lower income oblige them to pay for child care services, in order to compensate for opportunity cost losses.[28] On the contrary, overall larger proportions of married mothers using parental care support the idea that having two parents at home will increase the likelihood of using parental care. Also, finding greater percentages of never married mothers using unpaid family-based arrangements confirms the notion that these mothers are more likely to be poor and more in need for (financial and non-financial) help.

Table 12 presents mothers' work dynamic characteristics. Overall, White mothers are more likely to have paid jobs during a greater proportion of weeks. In addition, mothers, whose children use paid family-based, spend the largest proportion of weeks in paid jobs, across all racial/ethnic groups. Also, mothers relying on paid family-based care experience the greatest proportion of weeks working full time (compared to other arrangements) across all racial/ethnic groups. Among those using center-based care, Whites present the largest average proportions of weeks working full time (58%), as well as among those using paid family-based care (61%). Hispanic mothers whose children use unpaid family care (40%) and Blacks whose children use parental care (51%) work full time greater percentages of weeks, compared to the other racial/ethnic groups.

28 This is, the opportunity cost of providing child care services rather than entering the labor market.

Table 12
Mother's characteristics: Work characteristics at wave 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Proportion of weeks with paid job				
Center-based	77.7%	79.1%	77.1%	64.7%
Unpaid Family-based	59.9%	62.3%	56.3%	56.4%
Paid Family-based	85.6%	88.0%	82.9%	78.0%
Parental	80.9%	85.5%	69.1%	60.2%
Average proportion of weeks working full time				
Center-based	57.1%	58.2%	55.1%	52.5%
Unpaid Family-based	34.6%	33.0%	35.3%	40.2%
Paid Family-based	59.6%	60.7%	59.1%	55.6%
Parental	34.8%	33.0%	51.3%	32.3%
Average proportion of weeks working part time				
Center-based	15.8%	16.7%	15.2%	9.2%
Unpaid Family-based	20.3%	24.3%	14.4%	13.7%
Paid Family-based	19.6%	21.2%	14.9%	16.9%
Parental	36.8%	42.0%	11.1%	23.6%
Stable job				
Center-based	79.0%	79.6%	80.2%	70.0%
Unpaid Family-based	61.8%	63.8%	59.4%	57.6%
Paid Family-based	85.9%	87.9%	82.9%	80.3%
Parental	80.6%	85.0%	67.7%	62.2%
Unstable job				
Center-based	14.6%	11.2%	25.6%	14.8%
Unpaid Family-based	15.3%	15.1%	19.5%	9.6%
Paid Family-based	17.0%	16.3%	24.2%	13.5%
Parental	25.1%	26.6%	24.1%	16.0%
Did not work more than 35 hrs a week because of CC arrangement problems				
Center-based	7.9%	9.1%	5.0%	4.3%
Unpaid Family-based	8.9%	11.7%	5.0%	3.6%
Paid Family-based	6.7%	8.1%	4.1%	3.1%
Parental	16.3%	19.1%	6.3%	6.5%

Source: SIPP 1996

Moreover, White mothers work in part time jobs the largest proportions of weeks, across all arrangements. Also, the largest percentages of White and Hispanic mothers working part time are among those whose children use parental care (42% and 24%), whereas the same is true for Blacks using center-based arrangements (15%). In addition, White mothers are more likely to have stable jobs compared to Blacks and Hispanics, but those using center-based care, where Black mothers are the most likely. Hispanics are the least likely to have stable jobs. Between all

child care arrangements, mothers whose children use paid family arrangements, are the most likely to have stable jobs. With respect to mothers with unstable jobs, Table 12 presents a similar pattern as the one for mothers working part time. Compared to other arrangements, children in parental arrangements among Whites (27%) and Hispanics (16%), and Black children using center-based care (26%), are the most likely to have mothers with unstable jobs.

These findings suggest that although family-based arrangements are perceived as more unstable (particularly unpaid family-based arrangements), they are correlated with greater maternal labor force participation stability. Payments relatives receive for caring children, increase obligation feelings and improve the reliability on paid relatives as child care providers, compared to unpaid family caregivers. Nevertheless, it is also possible that these results are showing selection effects, this is, parents who find more stable or full time jobs are more likely to provide their relatives with higher monetary support through child care payments.

Additionally, it is likely that White and Hispanic mothers with part time or unstable jobs move their children from non-parental to parental child care arrangements, during periods when they are unemployed or employed part time. Parents are also likely to decide not to work longer periods of time in order to look for their children themselves. Largest proportions of mothers working less than 35 hours per week, because of child care arrangement problems, using parental care support this previous statement. Although it is not possible to differentiate parents who voluntarily decide to work part time or non-regularly from those forced to do it, children using parental child care arrangements experience more unstable family environment and child care dynamics. These children not only experience higher levels of child care instability, as previously mentioned, but also greater maternal labor force participation instability. Black mothers, on the other hand, are more likely to use center-based, rather than parental care.

Perhaps, given the larger external (governmental and non-governmental) support they receive, Black mothers are more likely to use center-based arrangement, even though their income is lower and certain eligibility requirements for governmental child care support, such as work requirements, are not always satisfied.

Table 13
Mother's characteristics: Program Participation characteristics at wave4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Mothers receiving AFDC/TANF				
Center-based	8.4%	3.7%	23.6%	9.1%
Unpaid Family-based	15.7%	8.8%	32.7%	16.5%
Paid Family-based	6.5%	4.2%	15.3%	7.8%
Parental	5.0%	2.9%	20.1%	6.2%
Total family AFDC				
Center-based	31.7	12.0	86.7	58.0
Unpaid Family-based	53.5	26.0	117.2	61.7
Paid Family-based	22.7	12.7	57.6	32.6
Parental	16.0	9.2	58.6	25.1
Receives SSI for child				
Center-based	0.9%	0.9%	0.8%	1.8%
Unpaid Family-based	1.8%	1.1%	2.8%	3.0%
Paid Family-based	0.4%	0.3%	0.7%	0.3%
Parental	0.9%	0.6%	0.9%	3.1%
Receives child support as bonus				
Center-based	0.7%	0.4%	1.9%	0.0%
Unpaid Family-based	0.8%	0.8%	1.0%	0.0%
Paid Family-based	0.1%	0.1%	0.0%	0.0%
Parental	0.1%	0.0%	0.8%	0.0%
Receives WIC				
Center-based	16.4%	8.7%	36.8%	30.3%
Unpaid Family-based	33.4%	24.0%	50.7%	43.3%
Paid Family-based	21.2%	14.2%	31.9%	41.3%
Parental	24.2%	22.0%	32.5%	32.0%

Source: SIPP 1996

Table 13 presents maternal program participation characteristics. Overall, we observe that Blacks are the most likely to receive AFDC/TANF (*i.e.* as a percentage of people and with larger monetary benefits), child support bonuses and WIC. Hispanic mothers are the most likely to receive SSI for their children, but those using paid family care, where Blacks are the most

likely (0.7%). Also, Hispanics using paid family care present the largest percentage of mothers receiving WIC (41%), compared to Whites and Blacks. Across all program participation variables included in Table 13, mothers' program participation (and income) is larger among children using unpaid family-based care (compared to other arrangements), except Black mothers receiving child support as bonus, whose percentage is largest among children using center-based care (2%).

Although Hispanics are also very likely to be poor, they are not as likely to receive large program participation benefits as Blacks. Several issues, such as non-eligibility (*e.g.* non-citizens, more likely to be married), or preferences for other non-governmental external support could explain these differences. For instance, among children relying on unpaid family care, whereas the proportion of Black mothers receiving AFDC/TANF (33%) almost doubles the proportion of Hispanic mothers (17%), the percentage of Black and Hispanic mothers receiving WIC is not as different (51% and 43%). Particularly, Hispanic mothers' marital status limits their AFDC/TANF eligibility and participation. Larger proportions of married Hispanic mothers constrain them from receiving larger AFDC/TANF benefits, but not SSI and WIC benefits. These results might suggest that Hispanics are actually willing to participate in programs, since the proportion of mother benefiting is higher among programs with fewer requirements (*i.e.* SSI and WIC).

Table 14
Mother's characteristics: Income and poverty characteristics at wave 4

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Total family income				
Center-based	4580.9	5221.0	2847.2	3568.6
Unpaid Family-based	3475.4	4035.0	2131.6	3382.4
Paid Family-based	4382.5	4917.6	3175.1	3246.5
Parental	3452.6	3636.8	2784.4	2791.2
Poor (below 1 of poverty line)				
Center-based	12.4%	5.8%	30.6%	23.0%
Unpaid Family-based	26.4%	15.4%	48.7%	34.7%
Paid Family-based	12.7%	8.2%	25.7%	20.0%
Parental	15.9%	13.7%	28.5%	20.0%
Non-poor (between 1 and 1.5 above poverty line)				
Center-based	10.4%	7.8%	16.0%	19.3%
Unpaid Family-based	12.9%	10.8%	18.1%	12.8%
Paid Family-based	8.9%	6.8%	11.9%	14.9%
Parental	13.1%	12.8%	13.4%	15.0%
Non-poor (above 1.5 of poverty line)				
Center-based	77.2%	86.5%	53.5%	57.7%
Unpaid Family-based	60.7%	73.8%	33.2%	52.5%
Paid Family-based	78.4%	85.1%	62.4%	65.1%
Parental	71.0%	73.5%	58.2%	65.1%
Total individual's income				
Center-based	2229.2	2576.2	1190.9	1991.3
Unpaid Family-based	1601.2	1964.2	820.4	1396.4
Paid Family-based	1913.8	2145.3	1505.4	1316.1
Parental	1338.5	1347.7	1290.7	1317.8
Mean-tested cash income				
Center-based	41.9	21.2	101.0	64.2
Unpaid Family-based	67.5	40.0	134.8	69.9
Paid Family-based	25.8	15.8	63.9	32.1
Parental	21.7	14.0	64.6	36.5

Source: SIPP 1996

Maternal and family income and poverty characteristics are presented in Table 14. White children are more likely to live in families and have parents with higher incomes and lower poverty levels.[29] On the contrary, Black children have lower income and high poverty families

29 A lower poverty level means that the individual is located higher in the poverty index scale, this is, has higher income, based on certain family characteristics. Those, whose poverty index is above 1, are considered non-poor and those who are below 1 are considered poor.

and parents, and receive, on average, greater amounts of mean-tested cash income. In addition, these findings show some interesting racial/ethnic differences. Among those who are located at lower income and higher poverty levels, greater proportions use unpaid family care, across all racial/ethnic groups. However, those with higher income and lower poverty levels use center-based care among Whites, and paid family care among Blacks. Hispanics using center-based care have, on average, higher family and individual maternal incomes. Although the largest proportion of Hispanic children living in families whose poverty levels are between 1 and 1.5 above the poverty line, rely on center-based care (19%), those whose families are above 1.5 of the poverty line, use paid family (65%).

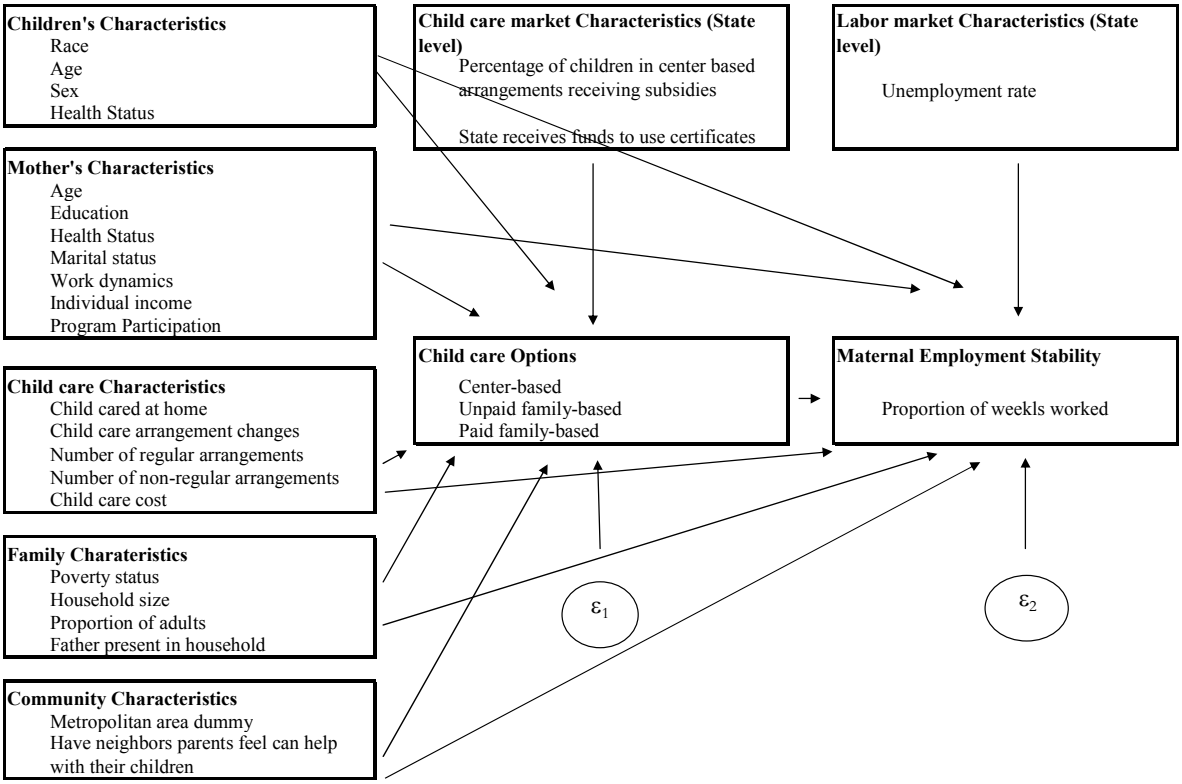
These findings suggest that unpaid family care is the most used and preferred child care arrangement, among lower income and higher poverty level parents. Larger proportions of poor families and parents using this arrangement are due to their need to work and hence, to use non-parental arrangements, and also their impossibility to pay for non-parental child care. On the contrary, higher income parents display large child care arrangement use variations by race/ethnicity. White parents are most likely to use, and potentially prefer, center-based care compared to other arrangements. High income African American parents are more likely to use paid family care, whereas Hispanics paid family and center-based care. Although it was expected to find larger family-based care preferences across all income/poverty levels among Hispanics, it is possible that high income Hispanic parents would prefer center-based care, as a result of cultural/social adaptation processes.

MODEL

This study's main goal is to examine effects of non-parental child care arrangement usage on maternal work stability, and their differences by parental racial/ethnic characteristics. Figure 1 describes the general path model. Empirical analyses are subdivided into two questions. *Question one* examines factors that determine non-parental child care usage, focusing on mother, child, household characteristics. Community and state level child care market characteristics are also included in the model. Although empirical analyses recognize the importance of all variables, this study's central focus is on the effect of *racial/ethnic characteristics* on non-parental child care arrangements usage.

Qualitative research reports strong racial/ethnic differences in the type of non-parental child care that parents prefer (Uttal, 1999; Brewster and Padavic, 2002). Studies show that White parents are more likely to prefer center-based settings, while Blacks and Hispanics are more likely to favor family-based arrangements as substitutes for parental child care. Although parents may have these race-based preferences, child care usage patterns are also determined by additional factors. Consequently, in addition to descriptive qualitative studies it is important to develop further quantitative analyses in order to understand potential inconsistencies between preferences and usage that are likely to arise. This is, external factors such as family income level, program participation access, father presence in the household, child care market characteristics, among others, are likely to move child care arrangement usage decisions away from parents' actual preferences. Understanding which factors determine this usage-preference deviation by race/ethnicity is essential, not only because of the mismatching problem itself but also because of the potential consequences on mother's labor force participation stability.

Figure 1
General Path Model



Question two explores the impact that predicted child care arrangement usage variables have on maternal work stability. It is expected that predicted child care arrangement variables, estimated from *question one*'s analyses, affect mother's work dynamic though racial/ethnic background characteristics' moderating effects. Assuming particular racial/ethnic preferences (*i.e.* Whites are more likely to prefer center-based arrangements, and Blacks and Hispanics are more likely to prefer family-based arrangements), specific child care arrangements used have different effects on maternal work, depending on whether the child care arrangement used matches racial/ethnic characteristics preferences or not. That is, mothers using child care arrangements that differ from their racial/ethnic child care preferences, may experience lower

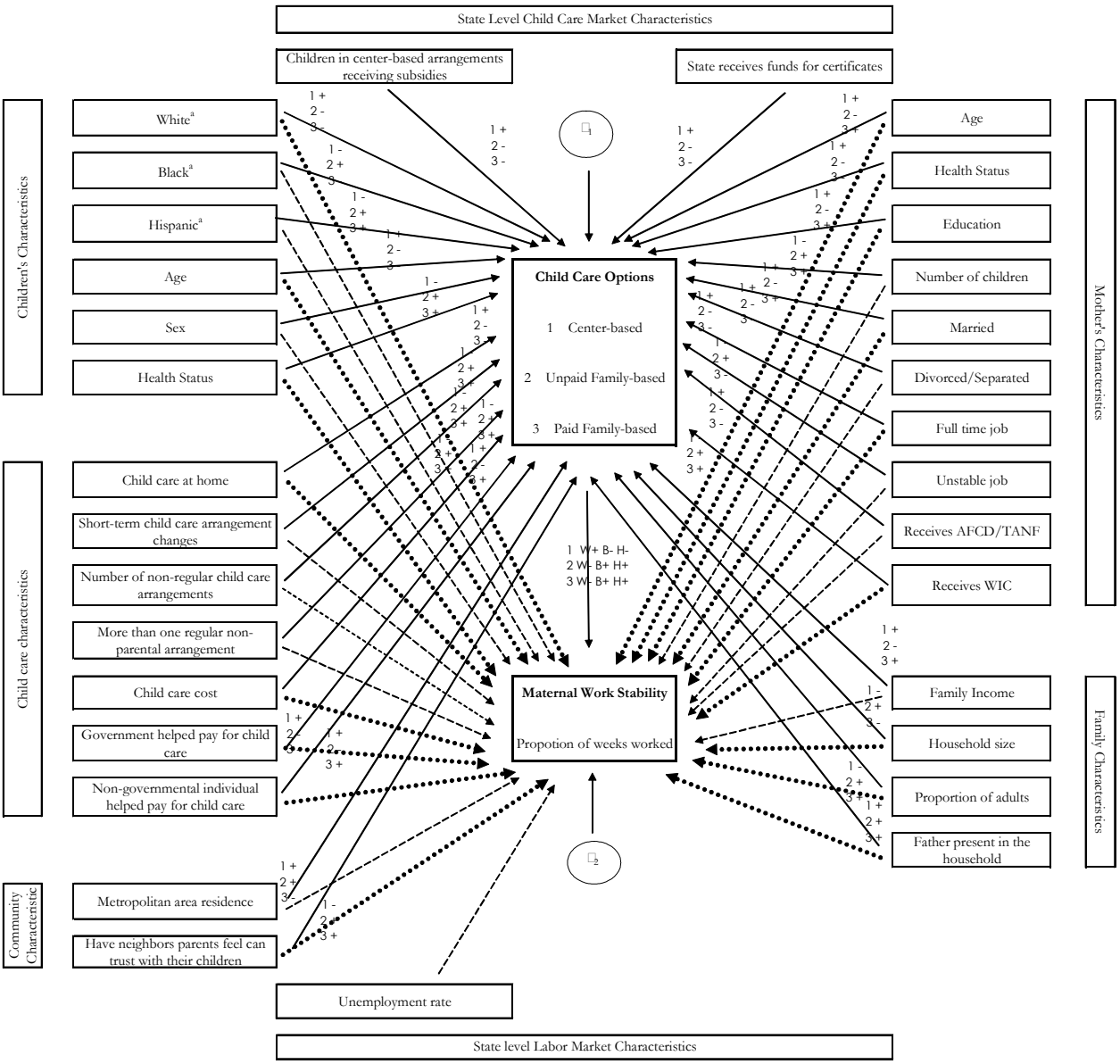
levels of work stability. Children's, mothers' and family/household characteristics, community characteristics, and labor market characteristics are also included in the analysis.

Figure 2 presents a more detailed path model, including expected signs and causal relationships. Two different estimation techniques are used to examine these two questions. A multinomial logit model is used to analyze *question one*, and a generalized estimating equation (GEE) model is used for *question two*.[30] One of the advantages of using multinomial logit regressions is that this type of estimation incorporates more information on the decision process using more detailed dependent variables. This is, multinomial logit models allow us to analyze the probability of using one child care arrangement compared to other child care arrangement's likelihood of use. On the contrary, more simple models such as probit models do not consider this disaggregation in the decision process. Given that three types of child care arrangements are examined in this study, a multinomial logit model is more appropriate because it includes all three choices, whereas a binomial logit or probit only includes two options (*i.e.* one type of child care versus the other two together).

A GEE model is used because this model not only incorporates the longitudinal nature into the analysis, but also because it unable us to analyze differences between individuals, and also within individuals over time. Although using simpler models (*e.g.* OLS, or logit models) could reduce complicated analyses and estimations, they overlook the longitudinal quality of these data. This information waste justifies the use of GEE models. In our particular case, the model captures not only deviations of child care arrangement usage from preferences' effects (by racial/ethnic groups), but also how changes over time affect maternal work stability.

30 Both, the multinomial logit model and the generalized estimating equation model are analyzed using STATA.

Figure 2
Detailed Path Model



Note: White population is the comparison group
positive effect
negative effect

Modeling these changes over time is very important, particularly for child care arrangement usage. Studies indicate that non-parental child care arrangement instability over time is high (U.S. Census, 2000; Blau, 2000, Meyers *et al.*, 2002), particularly among those children whose main primary providers are informal (*i.e.* family-based) (Meyers *et al.*, 2002;

Waldfogel, 2002). This instability affects not only children's developmental outcomes, but also mothers' emotional and work stability (Yoshikawa, 1999; Presser, 2000). Lacking stable child care arrangements increases barriers for stable maternal labor force participation, increasing maternal economic stress and hence, reducing their children's emotional well-being (Kisker and Ross, 1997; Jayakody, 1998; Bogenschneider, 2000; Lichter and Jayakody, 2002).[31]

In addition, this study intends to understand the child care use variable's *endogeneity* problem. This is, non-parental child care usage not only affects but also is affected by mothers' labor force participation stability. Consequently, including the observed child care use variable when analyzing maternal labor force stability patterns disregarding this endogeneity, can cause distortions and lead to inaccurate conclusions. An *instrumental variable model* controls for this *endogeneity problem,* estimating and including predicted variables that eliminate the correlation between the observed variable and the error term.[32]

EMPIRICAL ANALYSIS: MULTINOMIAL LOGIT

This section describes *question one*'s regression results. The dependent variable is the child's main child care arrangement, and examines whether it is: 1) center-based, 2) unpaid family-based, or 3) paid family-based. The comparison group is the center-based arrangement category. The analysis uses a stepwise analysis method for understanding the main effect of

31 Indeed, research indicates that high maternal work cycling has larger detrimental effects on children's anxiety and depression, than the actual intensity of working hours (Kalil, Dunifon and Dazinger, 2001; Dunifon et al., 2002). Also, Yoshikawa (1999) finds that unstable maternal labor market and welfare use dynamics (i.e. months on welfare, spells on welfare, proportion of welfare time working) reduce children's reading and math developmental abilities.

32 The endogeneity problem occurs when the classic theory assumption of correlation equal zero between the independent variables and the error term, does not hold. The instrumental variable is highly correlated with the problematic observed variable (i.e. the variable that has correlation different from zero with the error term), but has correlation equal zero with the error term (Greene, 1997).

racial/ethnic characteristics on non-parental child care arrangement usage. Table 15a and Table 15b present a group of eight models.

The basic multinomial logit model (Model 1) includes dummy variables for Blacks and Hispanics. The omitted group is Whites. Model 1 indicates strong race effects on the type of non-parental child care arrangement used. Previous qualitative studies show that Blacks prefer family-based arrangements, compared to center based care. Our results indicate that Blacks' use of family-based care depend on whether it is paid or unpaid. Although Black parents are significantly more likely to use unpaid family care, they are less likely than Whites to use paid family care, compared to center-based arrangements. The Hispanic variable coefficient is positive and significant on unpaid and paid family care usage regressions. These results suggest that although both Blacks and Hispanics are more likely to use unpaid family care than Whites, only Hispanics are more likely to use paid family-based arrangements, compared to center-based arrangements.

It is possible that greater access to child care subsidies (highly correlated with center-based child care use) among Blacks, increase their likelihood of using center-based care. Although previous studies show that Black and Hispanics are more likely to prefer family-based care than Whites, Blacks are more likely to use center-based arrangements. Potential explanations are higher poverty levels, larger percentages of non-married mothers, lack of relatives living geographically close, or relatives' high opportunity costs of caring for children among Blacks. Also, Hispanics are more likely to have available family whose opportunity costs of caring for their relatives' children (rather than enter the formal labor market) are smaller (*e.g.* illegal migrants, relatives who do not speak English). In addition, immigration barriers which

limit child care subsidy access among Hispanics, and even among subsidy eligible Hispanics, language problems, constrain Hispanics' center-based arrangement usage.

Model 2 in Table 15a includes child (*i.e.* age, sex and health status) and some maternal demographic characteristics (*i.e* age and health status). Including these variables does not change the direction nor the significance of the Hispanic variables' effects found in Model 1. However, the variable Black, even though the direction and significance of the effect on paid family remains the same, it looses significance on unpaid family. Adding more mother's characteristic variables (*i.e.* maternal education, number of children and marital status) does not change results from Model 2 (see Model 3). Potentially, Black coefficient's significant effect on unpaid family-based care was actually capturing children and mothers' demographic characteristics, rather than main race/ethnicity effects. Given that Black children are more likely to have mothers with lower education, not married or divorced/separated than Whites, including these variables modifies the Black variable main effect.

Model 4 (Table 15a) includes maternal work and program participation characteristics. Hispanic coefficients in both unpaid and paid family regressions remain unchanged, as well as the Blacks'. Potentially, program participation and maternal work variables are also absorbing the main effect of the Black variable on unpaid family use. Effects on paid family remain the same, probably because changes in program participation and work dynamics, affect parents' decision to move their children from paid to unpaid arrangements, rather than from family-based to center-based settings. As suggested before, this outcome indicates that Blacks are more likely to be affected by program participation and work dynamic characteristics than Whites.

Table 15a
Non-parental child care multinomial logit
Comparison group: Center-based

	Model 1		Model 2		Model 3		Model 4	
	Unpaid Family	Paid Family	Unpaid Family	Paid Family	Unpaid Family	Paid Family	Unpaid Family	Paid Family
Constant	**0.157** a	**0.172** a	**1.598** a	**0.549** a	**1.312** a	0.160	**1.608** a	0.064
	(0.052)	**(0.053)**	**(0.272)**	**(0.278)**	**(0.304)**	(0.316)	**(0.333)**	(0.348)
Child characteristics								
Black	**0.228** a	**-0.345** a	0.149	**-0.334** a	-0.168	**-0.394** a	-0.112	**-0.398** a
	(0.114)	**(0.128)**	(0.116)	**(0.129)**	(0.126)	**(0.138)**	(0.130)	**(0.139)**
Hispanic	**1.026** a	**0.835** a	**0.977** a	**0.850** a	**0.855** a	**0.854** a	**0.866** a	**0.827** a
	(0.160)	**(0.163)**	**(0.165)**	**(0.166)**	**(0.167)**	**(0.167)**	**(0.173)**	**(0.169)**
Child's age			**-0.330** a	**-0.366** a	**-0.348** a	**-0.363** a	**-0.344** a	**-0.355** a
			(0.044)	**(0.045)**	**(0.045)**	**(0.046)**	**(0.046)**	**(0.046)**
Child's sex			-0.114	-0.075	-0.114	-0.069	-0.115	-0.071
			(0.090)	(0.092)	(0.091)	(0.092)	(0.092)	(0.093)
Child's health status			-0.122	0.240	-0.098	0.235	-0.088	0.241
			(0.136)	(0.146)	(0.137)	(0.147)	(0.139)	(0.148)
Mother's characteristics								
Mother's age			**-0.018** a	0.007	0.007	0.010	0.011	0.010
			(0.008)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
Mother's health status (excellent/very good)			-0.157 a	-0.137	-0.053	-0.140	-0.021	-0.157
			(0.108)	(0.111)	(0.110)	(0.112)	(0.113)	(0.112)
College Graduate					**-0.451** a	-0.006	**-0.400** a	-0.007
					(0.102)	(0.105)	**(0.104)**	(0.105)
Number of children					**0.248** a	**0.310** a	0.156 a	**0.326** a
					(0.112)	**(0.110)**	(0.113)	**(0.110)**
Married					**-0.646** a	-0.103	**-0.636** a	-0.155
					(0.137)	(0.151)	**(0.143)**	(0.154)
Divorced / Separated					**-0.379** a	-0.073	-0.349	-0.092
					(0.185)	(0.201)	(0.187)	(0.201)

continues

	Model 1		Model 2		Model 3		Model 4		
	Unpaid Family	**Paid Family**	**Unpaid Family**	**Paid Family**	**Unpaid Family**	**Paid Family**	**Unpaid Family**		**Paid Family**
Full time job							**-0.789**	a	**0.222**
							(0.099)		**(0.101)**
Unstable job (alternate full / part)							-0.520		-1.235
							(1.606)		(1.635)
Mother receives AFDC/TANF							**-0.394**	a	-0.384
							(0.197)		(0.217)
Mother receives WIC							0.203		0.183
							(0.129)		(0.135)
Number of PSUs	3574		3574		3574		3574		
Population size	12249978		12249978		12249978		12249978		
F-Statistic	15.84 (4, 3570)		11.15 (14, 3560)		10.32 (22, 3552)		11.66 (30, 3544)		

a: <=5% significant

Table 15b
Non-parental child care multinomial logit
Comparison group: Center-based

	Model 5		Model 6		Model 7		Model 8	
	Unpaid Family	**Paid Family**	**Unpaid Family**	**Paid Family**	**Unpaid Family**	**Paid Family**	**Unpaid Family**	**Paid Family**
Constant	1.012	0.022	**1.366** a	0.425	**1.687** a	0.663	**2.309** a	1.017 a
	(0.541)	(0.570)	**(0.695)**	(0.557)	**(0.756)**	(0.594)	**(0.771)**	(0.611)
Child's characteristics								
Black	-0.142	**-0.401** a	-0.244	**-0.335** a	-0.258	**-0.351** a	**-0.797** a	**-0.696** a
	(0.135)	**(0.143)**	(0.193)	**(0.150)**	(0.193)	**(0.151)**	**(0.264)**	**(0.232)**
Hispanic	**0.744** a	**0.834** a	**0.713** a	**0.835** a	**0.714** a	**0.865** a	-0.391	0.230
	(0.178)	**(0.171)**	**(0.235)**	**(0.181)**	**(0.240)**	**(0.184)**	(0.412)	(0.348)
Child's age	**-0.343** a	**-0.353** a	**-0.369** a	**-0.362** a	**-0.367** a	**-0.364** a	**-0.369** a	**-0.367** a
	(0.046)	**(0.046)**	**(0.065)**	**(0.048)**	**(0.065)**	**(0.048)**	**(0.065)**	**(0.048)**
Child's sex	-0.105	-0.071	-0.133	-0.022	-0.126	-0.027	-0.133	-0.027
	(0.093)	(0.093)	(0.132)	(0.098)	(0.133)	(0.098)	(0.133)	(0.098)
Child's Health Status	-0.097	0.242 a	-0.192	0.179	-0.195	0.199	-0.237	0.185
	(0.140)	(0.149)	(0.220)	(0.162)	(0.222)	(0.163)	(0.224)	(0.163)
Mother's characteristics								
Mother's age	0.016	0.012	0.025	0.007	0.024	0.008	0.024	0.008
	(0.009)	(0.009)	(0.014)	(0.010)	(0.014)	(0.010)	(0.014)	(0.010)
Mother's health status (excellent/very good)	**-0.316** a	-0.012	-0.138	0.092	-0.148	0.112	-0.137	0.115
	(0.108)	(0.109)	(0.154)	(0.118)	(0.155)	(0.119)	(0.157)	(0.119)
College Graduate	0.010	-0.158 a	-0.043	-0.176 a	-0.034	-0.153	-0.026	-0.146
	(0.113)	(0.113)	(0.162)	(0.121)	(0.163)	(0.122)	(0.163)	(0.122)
Number of children	0.131	**0.364** a	0.181	**0.295** a	0.176	**0.294** a	0.179	**0.293** a
	(0.121)	**(0.119)**	(0.157)	**(0.122)**	(0.159)	**(0.122)**	(0.157)	**(0.121)**
Married	-0.243	-0.073	-0.448	-0.124	-0.422	-0.102	-0.493	-0.143
	(0.214)	(0.241)	(0.310)	(0.251)	(0.309)	(0.252)	(0.307)	(0.258)
Divorced / Separated	-0.355	-0.101	-0.210	-0.057	-0.195	-0.065	-0.278	-0.126
	(0.191)	(0.202)	(0.262)	(0.221)	(0.261)	(0.221)	(0.268)	(0.227)

continues

	Model 5		Model 6		Model 7		Model 8	
	Unpaid Family	**Paid Family**	**Unpaid Family**	**Paid Family**	**Unpaid Family**	**Paid Family**	**Unpaid Family**	**Paid Family**
Full time job	**-0.710** a	**0.224** a	**0.484** a	**0.314** a	**0.490** a	**0.308** a	**0.436** a	**0.288** a
	(0.101)	**(0.104)**	**(0.155)**	**(0.109)**	**(0.156)**	**(0.109)**	**(0.156)**	**(0.109)**
Unstable job (alternate full and part)	-0.216	-1.246	1.722	-0.706	1.776	-0.734	1.967	-0.694
	(1.605)	(1.637)	(2.077)	(1.874)	(2.159)	(1.931)	(2.187)	(1.897)
Mother receives AFDC/TANF	-0.377	-0.394	-0.041	-0.105	-0.035	-0.099	0.018	-0.046
	(0.201)	(0.221)	(0.250)	(0.245)	(0.250)	(0.245)	(0.248)	(0.244)
Mother receives WIC	0.126	0.185	0.009	0.195	0.006	0.205	-0.012	0.198
	(0.133)	(0.137)	(0.175)	(0.151)	(0.176)	(0.151)	(0.177)	(0.152)
Family characteristics								
Family Income	**-0.092** a	-0.018	-0.073	-0.032	-0.076	-0.033	-0.076	-0.030
	(0.044)	(0.053)	(0.042)	(0.042)	(0.043)	(0.043)	(0.043)	(0.043)
Household size	**0.159** a	-0.008	0.027	-0.020	0.025	-0.022	0.016	-0.027
	(0.036)	(0.037)	(0.045)	(0.036)	(0.045)	(0.036)	(0.044)	(0.036)
Percentage of adults	**0.774** a	0.258	**1.999** a	0.127	**2.038** a	0.078	**1.902** a	-0.039
	(0.398)	(0.409)	**(0.554)**	(0.428)	**(0.557)**	(0.429)	**(0.555)**	(0.430)
Biological father present	**-0.398** a	-0.113	0.154	-0.060	0.140	-0.065	-0.291	-0.278
	(0.198)	(0.228)	(0.305)	(0.238)	(0.304)	(0.239)	(0.329)	(0.255)
Biological father present * Black							**0.954** a	0.528
							(0.402)	(0.304)
Biological father present * Hispanic							**1.540** a	**0.831** a
							(0.498)	**(0.401)**
Child care arrangement characteristics and dynamics								
Uses child care at child's home			**2.129** a	**1.193** a	**2.139** a	**1.197** a	**2.152** a	**1.203** a
			(0.148)	**(0.124)**	**(0.150)**	**(0.125)**	**(0.150)**	**(0.126)**
Changed CC arrang. (past 4 weeks)			**0.608** a	**0.848** a	**0.622** a	**0.870** a	**0.623** a	**0.866** a
			(0.318)	**(0.192)**	**(0.319)**	**(0.194)**	**(0.322)**	**(0.194)**
Number of non-regular arrang. < 1 week (past 4 weeks)			**-0.064** a	-0.027	**-0.063** a	-0.024	**-0.062** a	-0.024
			(0.026)	(0.018)	**(0.026)**	(0.018)	**(0.026)**	(0.018)

continues

	Model 5		Model 6		Model 7		Model 8	
	Unpaid Family	**Paid Family**	**Unpaid Family**	**Paid Family**	**Unpaid Family**	**Paid Family**	**Unpaid Family**	**Paid Family**
More than one regular arrangement (dummy)			-0.042	**-0.332** a	-0.066	**-0.355** a	-0.068	**-0.372** a
			(0.310)	**(0.155)**	(0.309)	**(0.155)**	(0.310)	**(0.156)**
CC cost			**-0.113** a	**-0.004** a	**-0.113** a	**-0.004** a	**-0.113** a	**-0.004** a
			(0.009)	**(0.001)**	**(0.009)**	**(0.001)**	**(0.009)**	**(0.001)**
Government helped pay for CC			**-1.242** a	-0.211	**-1.279** a	-0.203	**-1.201** a	-0.188
			(0.475)	(0.342)	**(0.477)**	(0.346)	**(0.477)**	(0.346)
Non-gov indiv helped pay for CC			**-1.054** a	**-0.947** a	**-1.017** a	**-0.973** a	**-1.152** a	**-1.004** a
			(0.397)	**(0.248)**	**(0.400)**	**(0.251)**	**(0.400)**	**(0.251)**
State level child care market characteristics								
Percentage of children in center-based CC receiving subsidies					0.004	-0.370	0.020	-0.368
					(0.337)	(0.250)	(0.335)	(0.249)
State receives funds to use certificates					**-0.300** a	**-0.354** a	**-0.314** a	**-0.361** a
					(0.159)	**(0.119)**	**(0.159)**	**(0.119)**
Community characteristics								
Metropolitan area					0.134	0.033	0.124	0.027
					(0.174)	(0.134)	(0.175)	(0.134)
Parents have neighbors they trust to care for children					-0.055	0.084	-0.063	0.080
					(0.058)	(0.044)	(0.059)	(0.044)
Wave 4					-0.074	-0.033	-0.090	-0.038
					(0.139)	(0.101)	(0.139)	(0.101)
Number of PSUs	3574		3574		3574		3574	
Population size	12249978		12249978		12249978		12249978	
F-Statistic	9.96 (38, 3536)		10.39 (52, 3522)		8.96 (62, 3512)		8.57 (66, 3508)	

a: <=5% significant

Model 5 (Table 15b) includes additional family characteristic variables (*i.e.* family income, household size, percentage of adults and presence of biological father). All previously significant race/ethnicity variables remain the same. These results suggest that even though demographic, work and program participation, and family characteristics determine particular child care arrangement's usage probability, racial/ethnic characteristics' main effects remain important. Additionally, Model 6 and Model 7 in Table 15b show that adding child care characteristic variables (*i.e.* the former model) and state-level child care market characteristics (*i.e.* the later model), does not affect racial/ethnic characteristic variables' main effects.

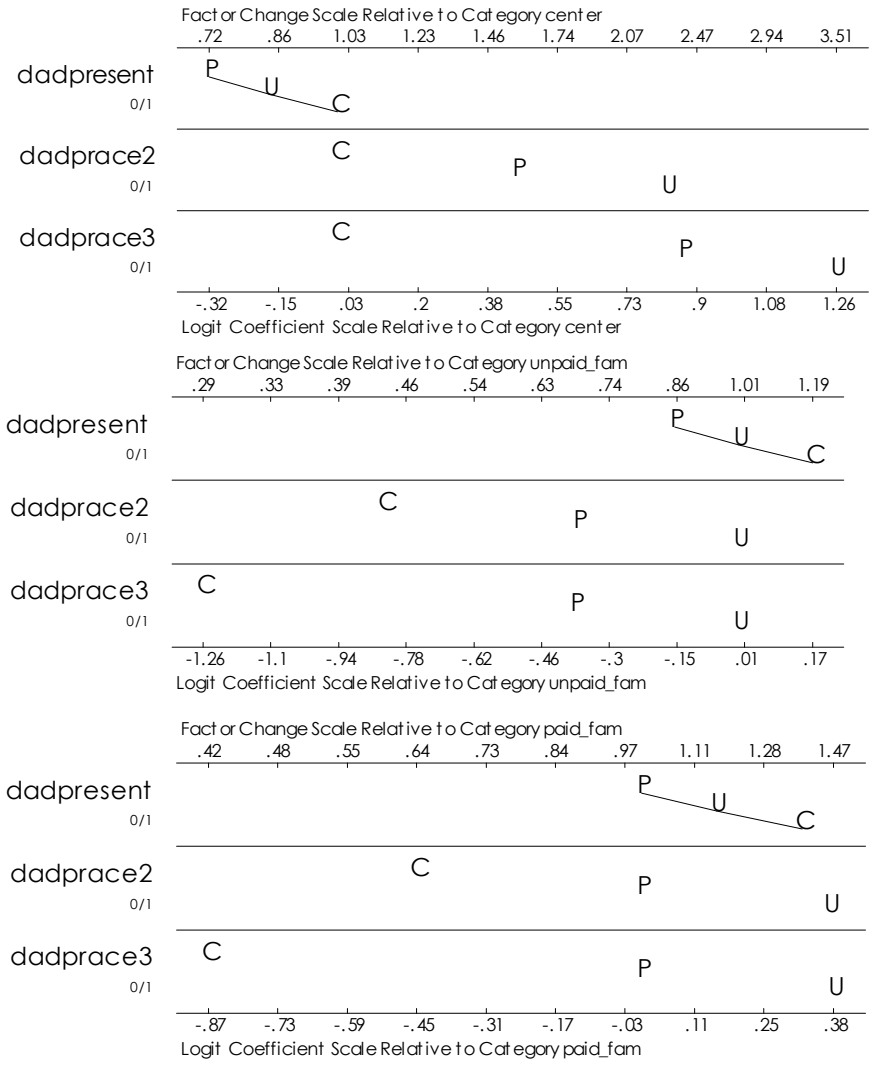
The final model in Table 15b (Model 8) includes interactions between biological father present and race/ethnicity. Although Model 5 included the direct effect of biological father present, the relationship between race/ethnicity and non-parental child care usage did not change. Including the interactions, however, altered this relationship. Model 8 shows that, even though the main effect of biological father present remains non-significant, both interactions with race/ethnicity have significant effects on the type of non-parental child care arrangement used.

Figure 3a describes the interaction variables' odd ratios. These numbers indicate the probability of using center-based care, unpaid family or paid family care,[33] as the independent variable (*i.e.* biological father present and the interactions with race/ethnicity) changes from 0 to 1, holding all other variables constant. These results indicate that, although biological father present's main effects are non-significant, it is larger on center-based usage and smaller on paid family-based care usage. On the contrary, effects of the interaction variables between biological father present and Black, as well as with Hispanic, are smaller on center-based usage and larger

33 These probabilities are relative to one of the child care arrangement types (for more information see Long; 1997).

on unpaid family care use. The interaction variable with Hispanic presents larger effects (compared to Whites and Blacks) on both paid and unpaid family-based care usage.

Figure 3a
Main and interaction effects: Biological father present and race/ethnicity

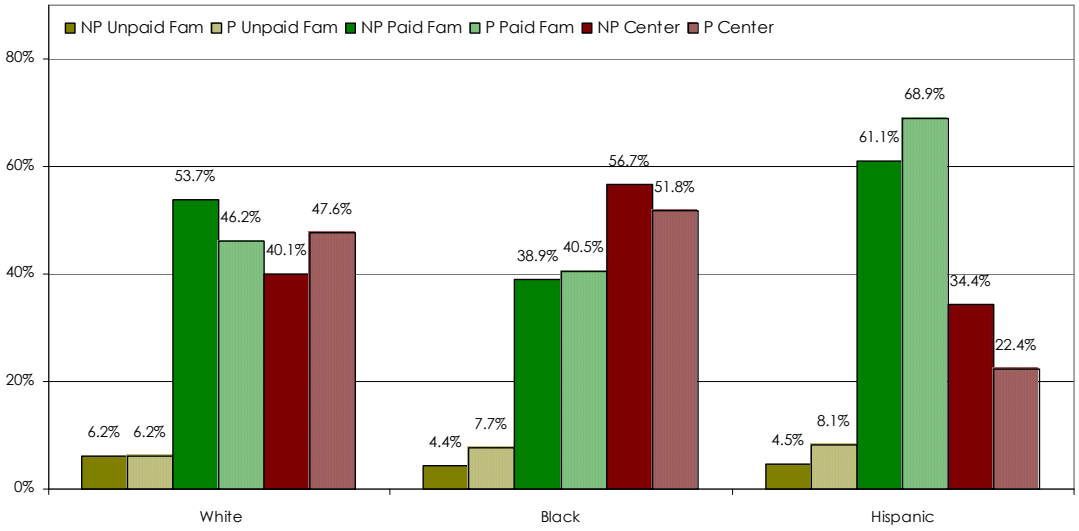


Source: 1996 SIPP
Note: dadpresent: Main effect; dadprace2: Interaction with Black; dadprace3: Interaction with Hispanic
C: center-based; U: unpaid family-based; P: paid family-based.
Points connected by lines represent non-significant effects.

These outcomes indicate that Black and particularly Hispanic co-resident fathers are less likely than White fathers to provide monetary support for non-parental child care arrangements.

Black and Hispanic children's co-resident biological fathers are more likely to work as social capital providers than Whites, rather than income providers. This is, Black and Hispanic children whose biological fathers are present, are potentially more likely to have better relationships not only with their mothers', but also with their fathers' relatives. Hence, they are more likely to use family-based care, compared to center-based arrangements. Potentially, larger percentages of Hispanic co-resident fathers than Blacks', explain greater effects for the Hispanic interaction.

Figure 3b
Discrete Change: Biological Father Present Main Effect and Race/Ethnicity Interactions



Source: 1996 SIPP
Note: NP: biological father not present; P: biological father present.
The estimation assumes esex=1; healthy=0; college=0; mhealthy=0; mom_marr=0; mom_divsep=1; mom_worhr1=1; mom_worhr3=0; cchome=0; edaycha=0; ewhopa1=0; epayhel=0; certificate=1; tmetro=1 and it fixes the remaining variables at their mean value

Figure 3b presents the estimated probability of using each non-parental child care arrangement, by race/ethnicity and presence of biological father. Holding other variables constant, this graph indicates the probability of using center-based, unpaid family-based and paid family-based arrangements, for Whites, Blacks, and Hispanics, and whether biological fathers

are present or not. These results show that the presence of the biological father in the household does not affect the probability of using unpaid family care among Whites, however it does affect the likelihood of usage among Blacks and Hispanics. Although Whites' unpaid family care usage is not affected by the biological father presence, they are more likely than Blacks and Hispanics to use unpaid family care, when fathers are not present.

In addition, Figure 3b indicates that the likelihood of using paid family care is larger among Whites compared Blacks, but smaller than the one estimated for Hispanics, when fathers are present. Nevertheless, this probability is equal for Whites and Hispanics (and greater than the one for Blacks) when fathers are not present. Also, Whites are the only group that shows lower likelihood of paid family care usage when fathers are present than when they are not. On the contrary, center-based usage when fathers are present is larger than when they are not present among Whites, but lower among Blacks and Hispanics. Blacks are always more likely to use center-based care than Whites and Hispanics and any other non-parental arrangement.

These results describe different roles biological fathers play, regarding child care usage decisions and availability of potential alternatives by race/ethnicity. These roles seem to be highly related to racial/ethnic child care preferences. Indeed, given White parents' larger preferences for center-based settings, White fathers are more likely to work as income providers. This improves their likelihood of relying on center-based arrangements and lowers their reliance on family-based caregivers among biological fathers who co-reside with their children. On the contrary, Black and Hispanic parents' greater preferences for family-based arrangements, affect fathers' social capital suppliers' role. Larger social capital increases the probability of finding relatives who will be willing to work as child care providers, and hence parental dependence on family-based arrangements. This model also shows that the Hispanic variable's main effect loses

significance, while Black's on unpaid family care regains significance. Probably, the interaction between biological father present and Hispanic variables captures the actual causal relationship between Hispanics and child care arrangement usage.

Furthermore, Table 15a and Table 15b present consistent results across all models, regarding all other covariates, hence, the following discussion will focus on Model 8's results. Regarding child's demographic characteristics, Model 8 shows negative and significant effects of child's age on unpaid and paid family care. This indicates that older children are less likely to use family-based arrangements. This result seems to contradict our initial hypothesis. However, it is possible that this effect does not necessarily occur because parents are more likely to rely on center-based arrangement when their children are younger. Potentially, this outcome is resulting from relying on family-based arrangements when parents have more children, which will increase the average age because of older siblings. This affects the relationship between age and family-based vs. center-based child care arrangement use.

Child's sex does not have a significant effect on neither unpaid nor unpaid family care usage. This suggests that there are no sex biases when deciding the type of child care arrangement to be used. Contradicting initial expectations, Model 8 presents non-significant effects of child health status on unpaid and paid family use. Sicker children were expected to use family-based care with higher likelihood than center-based arrangements. These results suggest no statistically significant relationships.

With respect to maternal characteristic variables, although mother's age presents a significant and negative effect on unpaid in Model 2, this effect looses significance when additional variables are included. Mother's self-reported health status also presents non-significant effects on unpaid and paid family-based usage, and also, mother's education does not

present a significant effect. The number of children per mother had a positive and significant effect on paid family use. Maternal marital status variables (*i.e.* married and divorced/separated) do not significantly affect the likelihood of using neither unpaid nor paid family care, compared to center-based care. These results indicate that although maternal demographic characteristics were expected to influence child care arrangement usage, they are not statistically likely to affect it. Potentially, family income and poverty levels, family structure, and child care arrangement dynamics are absorbing these characteristics' effects.

Regarding work dynamic and income variables, Model 8 presents significant effects only for mother's full time job on non-parental child care usage. Mothers working full time are more likely to use family-based arrangements (both, paid and unpaid) as their main child care arrangements, compared to center-based care. Potentially, center-based arrangements are less likely to cover for all the hours mothers are working. Consequently, mothers increase their use of family-based arrangements, particularly mothers working non-standard hours. Although Model 4 (Table 15a) presents mother receiving AFDC/TANF's coefficient as significantly affecting unpaid family care, this effect loses significance when family income and family structure variables are included (see Model 5).

In addition, including child care characteristics affects household composition's significance. Model 5 shows that household size, percentage of adults and presence of biological father variables significantly affect unpaid family usage, compared to center-based. Model 8 presents significant effects only for the percentage of adults (positive), and the interactions between biological father presence and race/ethnicity variables (positive) on family-based care use. These results suggest that co-resident relatives work as unpaid child care primary providers, and a co-resident biological father provides a larger source of social capital, among Blacks and

Hispanics. As mentioned above, this larger social capital increases the probability of relying on relatives as primary child care providers.

Child care characteristics and dynamics significantly affect unpaid and paid family usage. Caring children at their homes increases the likelihood of using family-based care. Although family-based arrangements are more unstable, caring children at their homes gives them certain level of stability. In addition, Model 8 shows that children whose child care arrangements changed in the past 4 weeks are more likely to use family-based arrangements. Nevertheless, children whose number of non-regular arrangements is larger, use unpaid family care with lower probability, compared to center-based care. This result contradicts initial expectations. Potentially, parents who value center-based care are willing to use additional non-regular arrangements to cover for supplementary or non-standard hours, in order to use center-based care as their main arrangements. Also, the negative and significant coefficient of the variable more than one regular non-parental arrangement on paid family use, support this previous statement.

With respect to child care costs, outcomes show statistically significant effects on unpaid and paid family arrangement usage. Model 8 indicates that parents who are willing to pay higher child care costs are less likely to use family-based arrangements, compared to center-based. Also, those receiving child care monetary support from governmental and non-governmental sources are less likely to use unpaid family care, compared to center-based arrangements. Those receiving non-governmental support are also less likely to rely on paid family care, compared to center-based. Cost related variables are likely to measure quality expectations parents and other monetary support providers have. Consequently, the probability of using higher quality arrangements (*i.e.* center-based settings) would increase.

Furthermore, state level child care market characteristics' outcomes indicate that states with larger percentages of children in center-based arrangements receiving subsidies are not significantly more or less likely to use family-based care. On the contrary, children living in states that receive funding for certificates are less likely to rely on family-based arrangements (paid and unpaid), compared to center-based care. These results suggest that state level child care policies that grant parents with more flexibility in their decision processes (*i.e.* investing larger proportions in certificates) are more effective increasing center-based child care usage. Given that center-based arrangements are more likely to have higher quality levels, children will benefit from these incentives. Finally, community characteristics show that parents with neighbors they trust to care for their children are less likely to use unpaid family, and more likely to use paid family care.

EMPIRICAL ANALYSIS: GENERALIZED ESTIMATING EQUATION

This section explores *question two*, how child care arrangements affect maternal work stability by race/ethnicity). The dependent variable is the proportion of weeks mothers worked in the past four months. Using a GEE model, this section intends to capture the effect that the type of child care arrangement used has on the proportion of weeks mothers worked (*i.e.* fixed effect) and how changes over time affect this relationship (*i.e.* random effect). That is, the model analyzes how using certain child care arrangements that deviate from preferred child care providers affect mother's work stability, and how these effects differ by racial/ethnic groups. Based on qualitative studies, the model assumes larger preferences for center-based care among Whites and for family-based arrangements among Blacks and Hispanics. Also, the model examines how changes over time affect maternal labor force participation dynamics.

Qualitative studies show that Blacks are more likely to use family-based arrangements, however, results from the multinomial logit analysis (see Table 15b, Model 8) indicate differences depending on the type of family-based care, either paid and unpaid family care. These findings indicate that, even though parents are likely to prefer certain arrangements, additional factors, such as demographic characteristics, family structure and income, market characteristics, affect their usage decisions. Although qualitative studies are less likely to capture these additional factors' effects, they provide us with valuable information for understanding household and maternal preferences and decision processes.

In addition, including predicted probabilities of child care arrangement usage rather than actual child care types used, controls for endogeneity problems.[34] Problems of endogeneity appear when an explanatory variable is correlated with the error term, breaking the normality assumption of zero correlation between the error term and independent variables. Given the two-way causal relationship between child care arrangement decisions and maternal labor force participation dynamic, including observed child care arrangement variables leads to problems of non-zero correlation with the error term. Predicted probabilities on the type of child care use, predicted from Model 8 (see Table 15b), are used.

Table 16 shows significant and positive effects on maternal work stability for both unpaid and paid family care predicted variables. This result suggests that mothers who rely on family-based arrangements, both paid and unpaid, as their main non-parental child care providers are more likely to have more stable jobs, compared to center-based users. We expected that given the more unstable nature of family-based settings, these arrangements would have had negative

34 One of the main issues regarding this type of estimation is the identification problem (see Greene, 1997). The identifiers used in this study are state level child care policy characteristics for estimating the child care arrangement usage and state level labor market characteristics included in the maternal work stability regression.

effects. Nevertheless, it is possible that this relationship changed after controlling for other characteristics, eliminating potential selection effects. That is, including the observed family-based child care variable would capture, for instance income or program participation issues rather than the actual child care usage and maternal labor force participation dynamics relationship. Hence, negative effects of unpaid family care on maternal work stability would be due to program participation effects, given that mothers who receive governmental support for child care are less likely to rely on family-based care. On the contrary, predicted non-parental child care usage probability variables show positive effects on labor force participation stability of mothers. These results suggest that non-parental family-based child care is likely to contribute to positive maternal work stability.[35]

Black's main effect on maternal work stability is non-significant, while Hispanic's is negative and statistically significant. This suggests that Hispanic mothers are less likely to have stable jobs. This result supports the idea that Hispanics are more reluctant to allow women, and particularly mothers, to enter the labor force than Whites. Interaction variables between predicted probabilities of child care arrangement usage and race/ethnicity, however, show positive and significant effects on maternal work stability with the Hispanic variable, and non-significant ones with the Black variable. Figure 4 presents these interaction variables' effects on maternal work stability. These bars represent the change in maternal work stability when the probability of using each non-parental child care arrangement is one, by race/ethnicity.

35 However, quality characteristics of the child care arrangement (and their effect on child development) are not accounted in this analysis.

Table 16
Mother's labor force participation stability: GEE model
Dependent variable: proportion of weeks worked in the past 4 months

	Model 1		
Constant	**0.413**	**(0.074)**	a
Child care arrangement instrumental variables			
Unpaid family (predict)	**0.105**	**(0.043)**	a
Paid family (predict)	**0.269**	**(0.056)**	a
Child's characteristics			
Black	-0.060	(0.075)	
Hispanic	**-0.590**	**(0.110)**	a
Unpaid family* Black	-0.005	(0.049)	
Paid family * Black	0.044	(0.091)	
Unpaid family* Hispanic	**0.383**	**(0.096)**	a
Paid family * Hispanic	**0.526**	**(0.126)**	a
Age	0.003	(0.004)	
Sex	**-0.019**	**(0.009)**	a
Health status (excellent/very good)	0.017	(0.013)	
Child hard to care	-0.004	(0.008)	
Mother - child relationship (1 not good)	-0.013	(0.009)	
Mother's characteristics			
Mother's age	0.001	(0.001)	
Mother's education (less than high school)	**-0.115**	**(0.020)**	a
Mother's health status (excellent/very good)	0.021	(0.011)	
Number of children	-0.013	(0.011)	
Married	**-0.091**	**(0.022)**	a
Divorced / Separated	0.010	(0.022)	
Mother receives AFDC/TANF	**-0.183**	**(0.016)**	a
Mother receives WIC	**-0.077**	**(0.011)**	a
Family characteristics			
Total family income	**0.046**	**(0.002)**	a
Household size	**-0.019**	**(0.003)**	a
Proportion of adults in hhld	**0.080**	**(0.041)**	a
Biological father present	-0.001	(0.022)	
Biological father present * Black	0.018	(0.033)	
Biological father present * Hispanic	0.027	(0.035)	
Child care arrangement characteristics and dynamics			
Uses child cared at home	**-0.046**	**(0.013)**	a
Changed CC arrang. (past 4 weeks)	-0.020	(0.019)	
Number of non-regular arrang. lasted less than a week (past 4 weeks)	0.000	(0.002)	
More than one regular arrangement (dummy)	-0.007	(0.014)	
Child care cost	**0.001**	**(0.000)**	a
Government helped pay CC	0.026	(0.034)	
Non-gov indiv helped pay CC	0.030	(0.028)	

continues

	Model 1		
State level labor market characteristics			
State level unemployment rate	**-0.011**	**(0.006)**	a
State level unemployment rate * Black	0.018	(0.013)	
State level unemployment rate * Hispanic	**0.038**	**(0.014)**	a
Number of observations	8745		
Population size	31007705		
F-Statistic / X^2	1358.13 (37)		

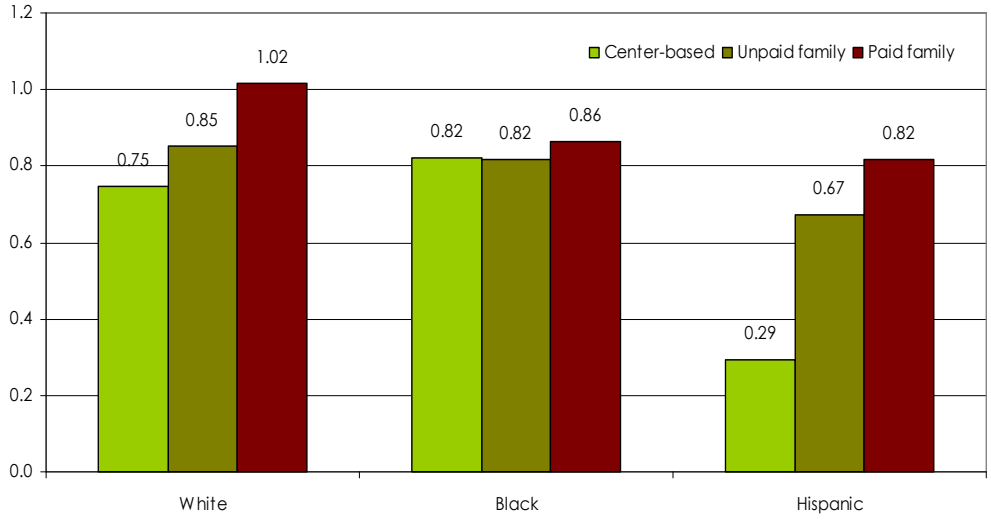
a: <=5% significant

These results indicate that even though Black mothers show no significant differences by non-parental child care arrangement on maternal work stability, their effect of using center-based arrangements is larger than the one for Whites and Hispanics. This contradicts initial expectations regarding child care arrangement usage vs. preference effects on maternal labor force participation dynamics among Blacks. However, these outcomes show that, although not statistically significantly different, paid family usage has larger effects on maternal work stability than unpaid family-based care usage. Potentially, monetary compensations are likely to increase not only family child care providers' sense of obligation and hence stability, but also mothers' responsibility and participation in the labor market over time.

Whites' interaction effect with paid family arrangement usage is larger than with unpaid family and even larger than with center-based care. Although qualitative studies indicate lower preferences for family-based child care arrangement usage, it is possible that confounding effects with other variables affected this relationship. Potentially, controlling for these variables (*i.e.* through Model 8 estimations) reduces the size of Whites' center-based child care arrangement preferences. Consequently, even though we expected larger positive effects of center-based usage (than family-based arrangements) on mothers' labor force participation stability among Whites, these results show larger effect of unpaid and particularly paid family-based arrangements. Additionally, these outcomes also show important differences between paid and

unpaid family arrangements' effects. Similarly to Blacks, it is possible that providing monetary payments to family child care providers would also increase Whites' feelings regarding family-based arrangements as better substitutes of parental care.

Figure 4
Interaction variables' effects on maternal work stability
By child care arrangement and race/ethnicity



Source: 1996 SIPP
Note: The estimation assumes esex=1; healthy=0; mom_sch1=0; mhealthy=0; mom_marr=0; mom_divsep=1; mom_epatyn=0; mom_ewicyn=0; cchome=0; edaycha=0; dccnum=0and it fixes the remaining variables at their mean value (see Table 16).

Moreover, Figure 4's findings support our initial hypothesis that Hispanic mothers, who match their child care preferences using (unpaid and paid) family-based arrangements, are more likely to have stable jobs than those using center-based arrangements. These results also suggest differences between paid and unpaid family-based care's effects on maternal stability. Although paid family effects on maternal work stability are larger than center-based arrangement use across all racial/ethnic groups, Hispanics' paid family care effect is more than twice as large as the effect of center-based care. This result suggests that mismatches between preferred and used child care arrangement types, particularly center-based vs. paid family-based care, have greater

effects on Hispanic mothers' labor force participation dynamics than on White mothers', and certainly than on Black mothers'.

Additionally, Table 16 shows that child's sex has a negative and significant effect on maternal stability. This is, having a boy reduces the likelihood of having stable jobs. Mother's less than high school education also has a negative and significant effect on mother's work dynamics. This result supports the idea that less educated mothers have low-skilled and unstable jobs and hence, they are more likely to experience instability in the labor market.

Mothers who participate in government programs (*i.e.* AFDC/TANF and WIC) are also less likely to work larger proportions of weeks. This outcome supports previous studies that indicate that mothers who still rely on public assistance have larger barrier for labor force participation. The 1996 welfare reform required mothers receiving TANF to participate in the labor market, and hence, a large group of them were able to leave welfare. However, a group of mothers remains incapable to find stable jobs or leave welfare. Potentially mothers who stay on welfare are those with larger barriers, such as lower educational level, or drug and alcohol dependence.

In addition, Table 16 indicates that the family income coefficient is statistically significant and positive. This is, mothers living in higher income households are more likely to maintain stable jobs. Family structure characteristics also significantly affect maternal stability in the labor market. Larger household sizes reduce the proportion of weeks mother worked, however, larger proportions of adults in the household increases mother's labor force participation stability. Biological father presence does not have a significant impact on maternal work dynamics. Although this result is inconsistent with previous studies, it supports our previous results that describe fathers' roles mainly as social capital providers, rather than income

providers. With respect to child care characteristics and dynamics, we observe that mothers, whose children are cared at home, are less likely to have stable jobs. On the contrary, mothers, who are more willing to pay higher child care costs, are more likely to experience more stable labor force participation. Although we expected significant effects, child care arrangement dynamic variables (*i.e.* changes in regular child care arrangements, number of non-regular child care arrangements and having more than one regular arrangement) do not have statistically significant effects on maternal work stability.

Table 16 indicates differential effects of state level labor market characteristics, by race/ethnicity. Although state level unemployment rate's main effects on maternal work stability is statistically significant and negative, the interaction term with Hispanic is positive and statistically significant. The interaction term with Black is non-significant. These results suggest that poor state labor market conditions reduce mothers' likelihood of finding stable jobs. However, the positive and significant effect of the interaction unemployment with Hispanic is explained by larger concentration of Hispanics on high-unemployment areas. Nevertheless, it is possible that the unemployment status of this population respond to conditions such as migratory statuses, or cultural factors. These elements are likely to increase their entrance into informal labor markets, particularly working child care providers. These conditions contribute to increasing Hispanic working mothers' labor force participation stability, assuring easily available and cheap child care access.

CONCLUSIONS

Mothers entering the labor force, increasingly face child care problems. Most studies investigating these problems focus on availability/cost issues affecting family income and

parental work, and quality problems affecting children's development. Quantitative studies describe child care usage effects on parents, and particularly mothers, and children, although they are less likely to explore effects of preferences. Qualitative studies, on the other hand, examine preferences observing racial/ethnic differences regarding child care arrangement preferences. Integrating these types of analyses is fundamental, particularly for understanding potential mismatches between child care usage and preference patterns and their effects on maternal work stability. This study analyzes two questions: 1) how do racial/ethnic characteristics affect non-parental child care arrangement usage, and 2) how do mismatches between child care arrangement usage and preferences by race/ethnicity, affect maternal work stability. The study answered these questions using data from the SIPP. Results indicate:

- Racial/ethnic differences not only between center-based and family-based child care usage, but also between paid and unpaid family-based arrangement use.
- Although Black parents are less likely to rely on paid family-based care than Whites, compared to center-based arrangements, there are no statistically significant differences between using unpaid family care and center-based arrangements.
- Hispanics are significantly more likely to use both unpaid and paid family-based arrangements, compared to center-based care, than Whites.
- Biological father presence increases the likelihood of using family-based arrangements (unpaid and paid) among Blacks and Hispanics, compared to Whites. This result suggests that Black and Hispanic fathers are more likely to work as social capital providers (increasing family-base arrangement use), while White fathers, are more likely to work as income providers (increasing center-based arrangement usage).

- Governmental programs have positive effects on center-based arrangement usage. Parents receiving governmental monetary help for paying child care are less likely to rely on unpaid family-based care compared to center-based arrangements.
- Parents living in states receiving funding for child care certificates are less likely to use both unpaid and paid family-based providers, compared to center-based arrangements. This result suggests that public child care policies that improve flexibility levels in parental child care selection processes, increase center-based arrangement usage. Although some parents are less likely to prefer center based arrangements, these arrangements have, on average, higher quality levels. Consequently, center-based arrangements are more likely to positively affect children's developmental outcomes.
- Regarding maternal work stability, family-based (both unpaid and paid) arrangement usage, compared to center-based care, is more likely to increase Hispanic mothers' labor force participation stability than White mothers'. Black mothers' work dynamics are not significantly affected by neither unpaid nor paid family-based child care usage.
- State level labor market characteristics have different effects by race/ethnicity. Although high unemployment rates have negative main effects on maternal work stability, Hispanic mothers living in states with large unemployment levels are more likely to experience more stable labor force participation. Potentially, Hispanic unemployed people are more likely to work as informal family child care providers, improving low-cost child care availability.

Furthermore, this study's results propose several policy recommendations and future research topics of study. As mentioned above, racial/ethnic characteristics need to be considered

when designing child care and maternal labor force participation and stability oriented policies. This issue is particularly important for potential welfare program reforms. Additionally, these outcomes indicate the importance of biological father presence on child care usage and mothers' work stability. Although past and current welfare policies minimize father's role, narrowing it to income provider, this study finds that father's role as social capital provider is particularly important among Blacks and Hispanics. Also, state level child care and labor market policies are likely to have positive impacts on child care usage decisions and mothers' work stability.

Finally, further research should focus on fathers' active participation on child care decisions by race/ethnicity, as well as their effect on mothers' stability. Also, additional state level child care policy variables should be included, particularly those that intensify constraints and requirements narrowing parents' use to center-based arrangements only. Moreover, additional child care quality characteristics need to be included, mainly those enhancing children's cognitive, emotional and social development. In addition, further qualitative studies that analyze child care preferences by race/ethnicity need to be developed.

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APPENDIX 1
Database Description

Name	Advantages	Disadvantages	Notes
SIPP: Survey of Income and Program Participation	- Medium term longitudinal survey, nationally representative - It is collected every 4 months for 52 months (better to describe the medium-term dynamics of the behavior of individuals and families). - Focuses on the classification of income sources, program participation, labor force participation, living arrangements (child care arrangements), measures of assets and liabilities - Includes variables that describe the quality of the child-care arrangement used depending the age of the child (see Ribar, 1990 and 1993). - Pre- and post- welfare reform information	- The sample collected is people 15 years and over in the original sample household (the information for the group of children 15 and younger is reported by the father) - Each wave collects different groups of topics (assume those topics do not need to be updated on each wave)	- Census Bureau
NLSY: National Longitudinal Survey of Youth	- Long term national longitudinal survey - Contains detailed information about variables of family satisfaction; labor force experience; demographic characteristics of the household; health conditions; psychological well-being	- It has been widely explored - It is collected only once a year	- Bureau of Labor Statistics

Name	Advantages	Disadvantages	Notes
SPD: Survey of Program Dynamics	- Long-term panel survey, nationally representative, collected annually. - Has more detailed variables about welfare reform, such as program eligibility and participation; monetary and in-kind household income and services. Also labor force participation; demographic and family characteristics; and child outcomes and child care arrangements - Contains 3 types of information: (i) process information; (ii) cross-sectional and (iii) longitudinal - Pre- and post- welfare reform information	- Uses data from the 1992-1994 and 1993-1995 SIPP to complete a panel	- Census Bureau - Only the 1997 (bridge survey) and the 1998 surveys are available for the public (the 1999 is not)

Name	Advantages	Disadvantages	Notes
PSID-CDS: Panel Study of Income Dynamics	- Nationally representative longitudinal survey - Focuses on financial matters; family structure and demographic measures; labor market work; housework time; geographic mobility; socio-economic background; health - Starting in 1990, a representative group of Latinos was added with more detailed information (background information)	- It does not have good measures of family satisfaction - In the 1999 wave, 97.5% of the interviews were conducted over the phone, and all interviews were conducted using computer-based instruments (problem of bias). - Uses retrospective income data (for monthly income) of the past year, collected through annual interviews - The original sample contains a small number of Latino households. This does not provide reliable estimates.	- Survey Research Center Institute for Social Research, University of Michigan - First survey: 1968 - The 1997 survey has the Child Development Supplement (reported by parents, teachers, other caregivers and the child itself). Collects measures of children's well-being
NSAF: National Survey of American Families	- Focuses on low income families - Emphasizes topics such as welfare reform and other major policy changes, health care, social safety net, child well-being and family environment, economic security	- Uses probability sampling methods to select households from only 13 states - From each household only one child under 6 and one between 6 and 17 are randomly selected - The person identified as parent is not always the parent of the child (however, there are only a few cases in which this person is not) - Cross section survey	- Urban Institute - Conducted from February to October 1999 (previous survey 1997, forthcoming survey 2002)

APPENDIX 2

Table 2.A
Main child care arrangement use: wave 10

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Weighted				
Total	100.0% (17,718,966)	68.1% (12,072,993)	17.7% (3,144,100)	14.1% (2,501,873)
Center-based	23.4% (4,138,812)	24.3% (2,936,439)	28.5% (894,592)	12.3% (307,782)
Unpaid Family-based	29.1% (5,160,974)	25.6% (3,085,900)	36.6% (1,150,297)	37.0% (924,777)
Paid Family-based	26.4% (4,677,230)	28.0% (3,375,226)	19.2% (604,399)	27.9% (697,605)
Parental	21.1% (3,741,949)	22.2% (2,675,427)	15.7% (494,813)	22.9% (571,709)
Unweighted				
Total	4,835	3,322	818	695
Center-based	1,101	800	224	77
Unpaid Family-based	1,460	873	316	271
Paid Family-based	1,270	917	158	195
Parental	1,004	732	120	152

Source: 1996 SIPP
Note: The numbers in parentheses are the weighted population sizes

APPENDIX 3

Table 10.A
Children's characteristics: Demographic characteristics at wave 10

	Total	White Non-Hispanic	Black Non-Hispanic	Hispanic
Age				
Center-based	1.80	1.75	2.05	1.55
Unpaid Family-based	1.50	1.53	1.41	1.53
Paid Family-based	1.46	1.48	1.32	1.45
Parental	1.41	1.41	1.31	1.52
Sex				
Center-based	52.2%	51.2%	56.6%	49.1%
Unpaid Family-based	49.2%	50.6%	45.0%	49.7%
Paid Family-based	49.0%	49.9%	44.0%	49.5%
Parental	51.3%	51.5%	51.2%	50.5%
Mother's health status report (excellent and very good vs. other)				
Center-based	84.4%	86.4%	76.4%	88.2%
Unpaid Family-based	78.4%	84.5%	67.9%	70.9%
Paid Family-based	84.7%	87.9%	76.5%	76.1%
Parental	83.1%	85.7%	73.2%	79.4%

Source: 1996 SIPP